

JULY 1995

# HP Professional

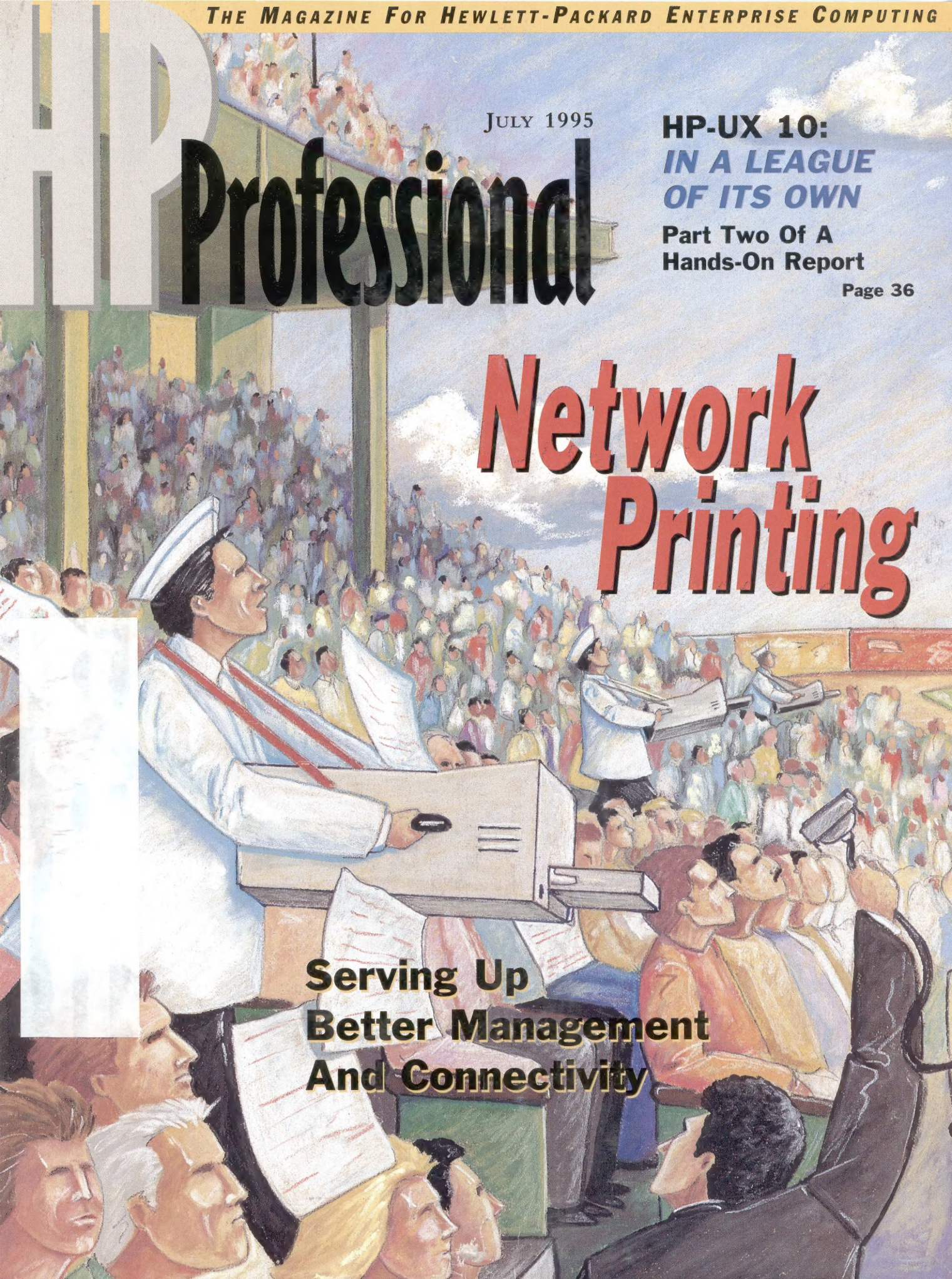
**HP-UX 10:  
IN A LEAGUE  
OF ITS OWN**

Part Two Of A  
Hands-On Report

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## Network Printing

**Serving Up  
Better Management  
And Connectivity**

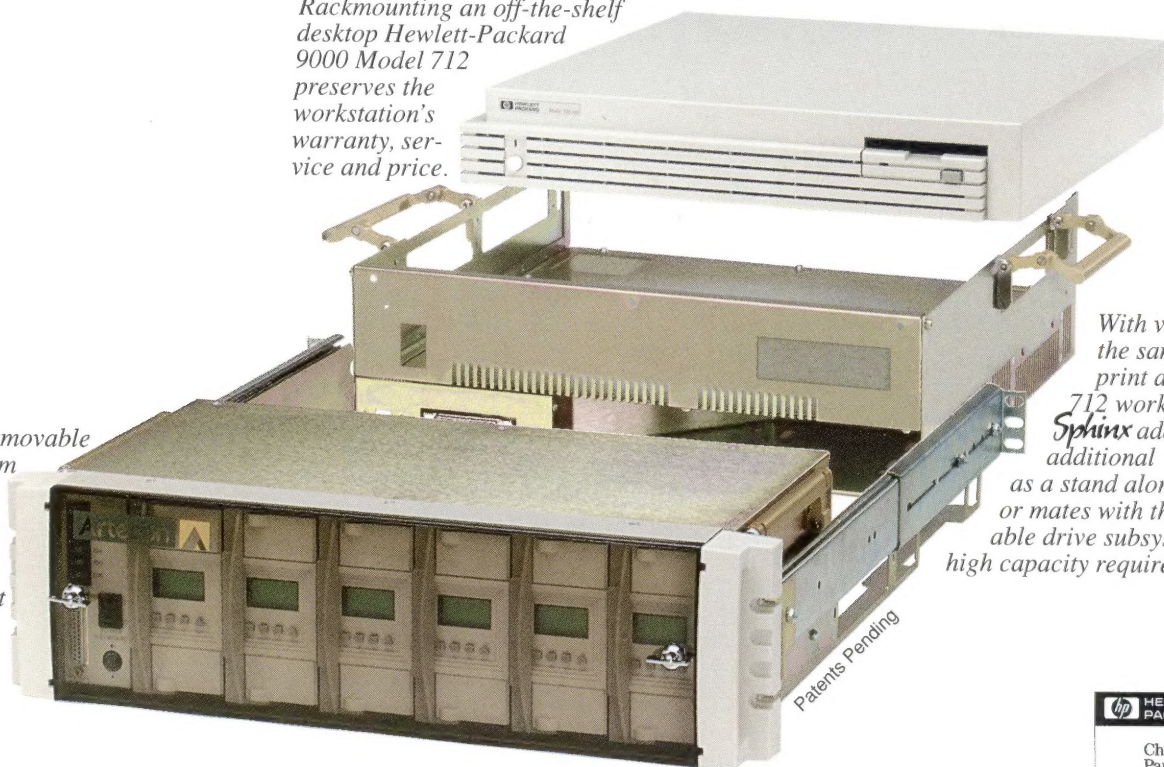




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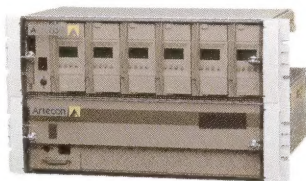


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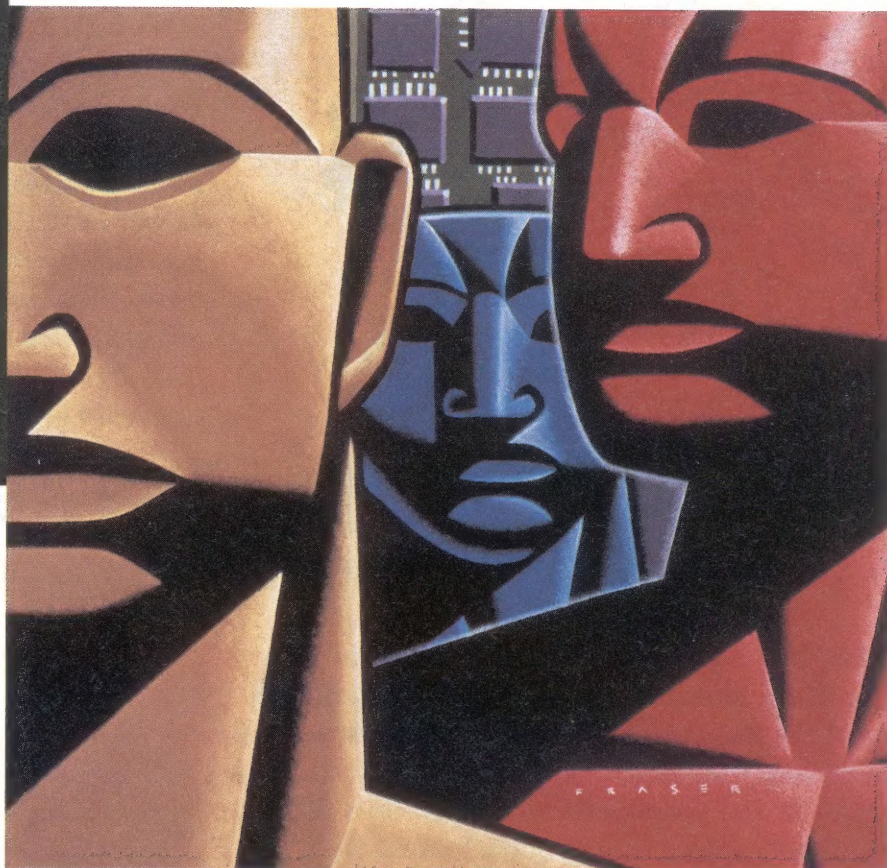
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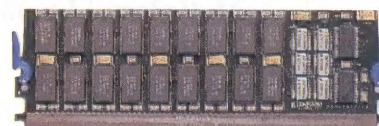
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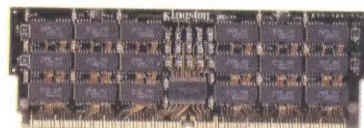
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**CIRCLE 281 ON READER CARD**



# It was UGLY.



Joe bit it when he tripped over a mess of SCSI and power cables (12 stitches). Two days ago, he disconnected the server from the network (4 hours downtime). Last week, he was taking apart a tape drive he thought was bad when his screwdriver slipped and hit the power supply (fried drive, power out for two hours). Stacy tried to help him out and called the vendor to get a replacement for the fried drive, only to find out it would be two days before one could be shipped (2 days without backup).

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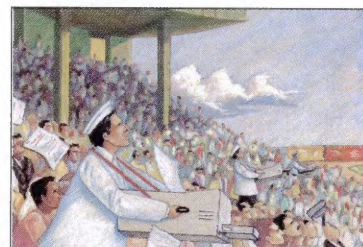
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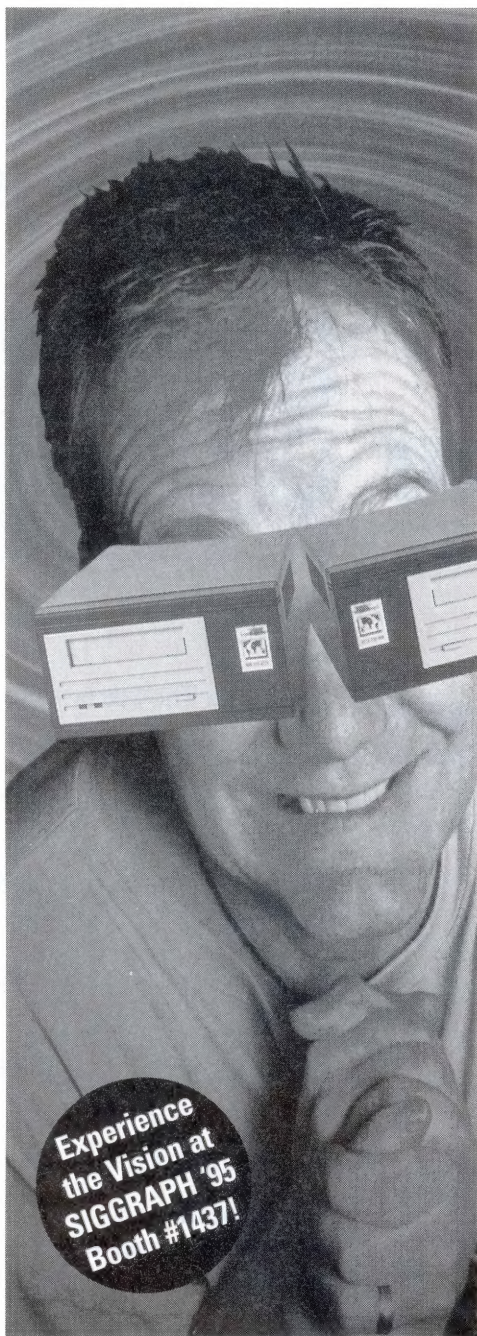
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**HP Professional**

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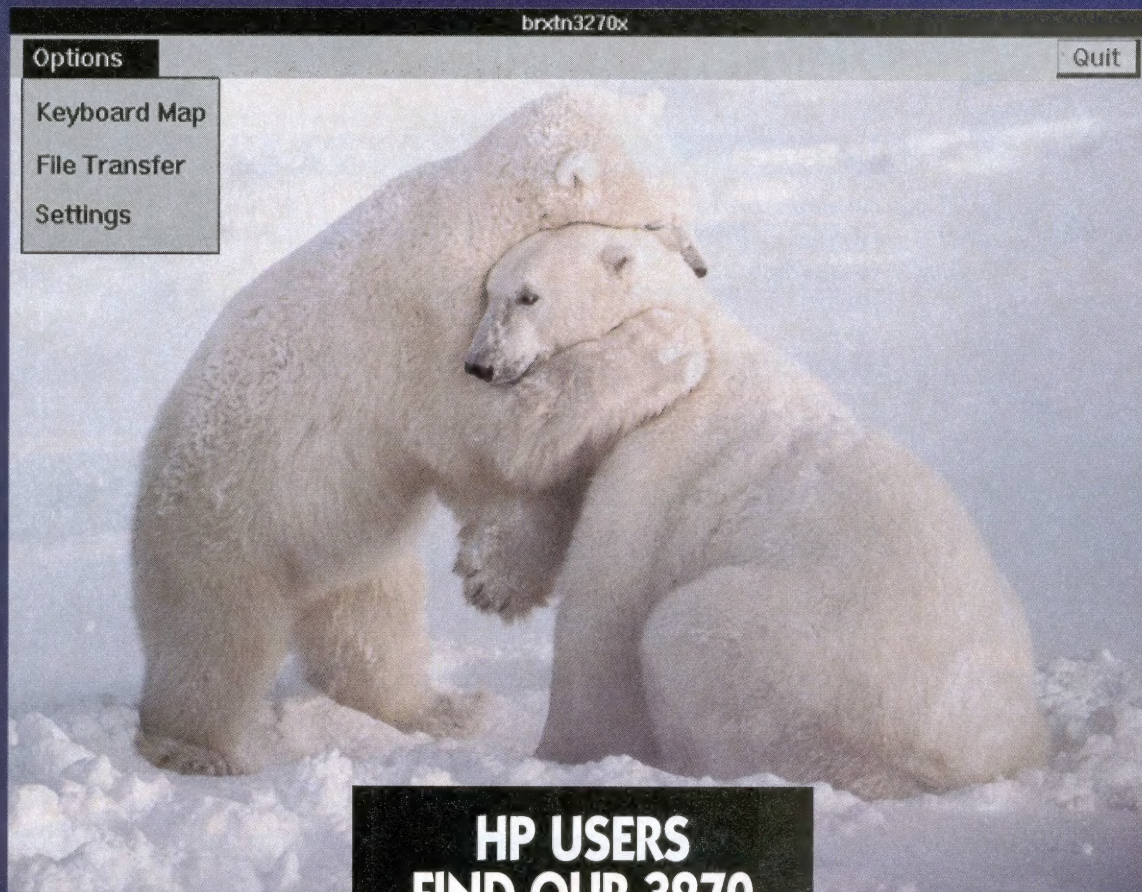
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# If You Make Me Pay, Then Do What You Say

Remember when service stations, meant service? Service with a smile even. They checked the oil, filled the tank, cleaned the windows and you got a free sports mug or road map for your patronage.

Now you're lucky if you get to speak with an "attendant" on an intercom through a bullet proof shield, and that's after you stand in the rain pumping your own gas and putting air (for 50 cents) in your tires. However, if you look closely you can once again find the full service islands at the service station. But now you pay extra for it.

OK, fine. I don't mind paying — *for good service*. Good service, however, can be hard to define. But I know what I don't like. Pushy sales people, for instance. Recently, a Thermogard Windows (Hammonton, N.J.) salesperson told me that my marriage would suffer if I didn't buy Thermogard windows. Yeah, right.

I also don't like companies that don't deliver what they promise. Remember the Challenger I was trying to sell. I placed an ad with an agency called AutoSearch (Miami, Fla.). For a fee, they "guaranteed" to sell my Challenger for the price I wanted "within 150 days or a full refund."

But after 160 days without a single inquiry about the car, I wrote for the aforementioned refund. Can you guess what happened next? I needed a private investigator to find AutoSearch. The company was history, their phone was disconnected and, of course, I could forget about a forwarding address. Live and learn, eh?

After six months, we finally sold the damn car. And then we bought a Chrysler minivan, an ideal vehicle for our needs. But as you may know, there were reported problems with the lift-gate. Chrysler sent us a letter of notification, scheduled a recall repair date and will fix the problem. Unlike my experiences with Thermogard and AutoSearch, Chrysler admitted a mistake, minimized my fears and anticipated my needs by providing a cost-effective solution.

So what's the point? Just as I was thinking that the lack of service in our culture was the way of the world, Chrysler treats me with with respect — the way I want to be treated. And I liked it enough to write about it.

It doesn't matter whether its windows, cars or computers. To their credit, some computer vendors, like some service stations, make you pay for personal service. But we expect our vendors to deliver what they promise. Don't we?

## TO SERVE MAN? OR ARE OUR CORPORATE MOGULS LOST IN SPACE?

Four well-known computer personalities — David Packard, Gordon Moore, Paul Allen and Mitch Kapor — recently pledged a total of over \$4 million to the SETI Institute. The purpose of the group is to locate extraterrestrial life.

I understand these guys probably give to other worthy charities, but I got a message for these space cadets: PHONE HOME... There are enough terrestrials right in Silicon Valley's backyard who could use that money for slightly more important projects, like eating or clothing themselves.

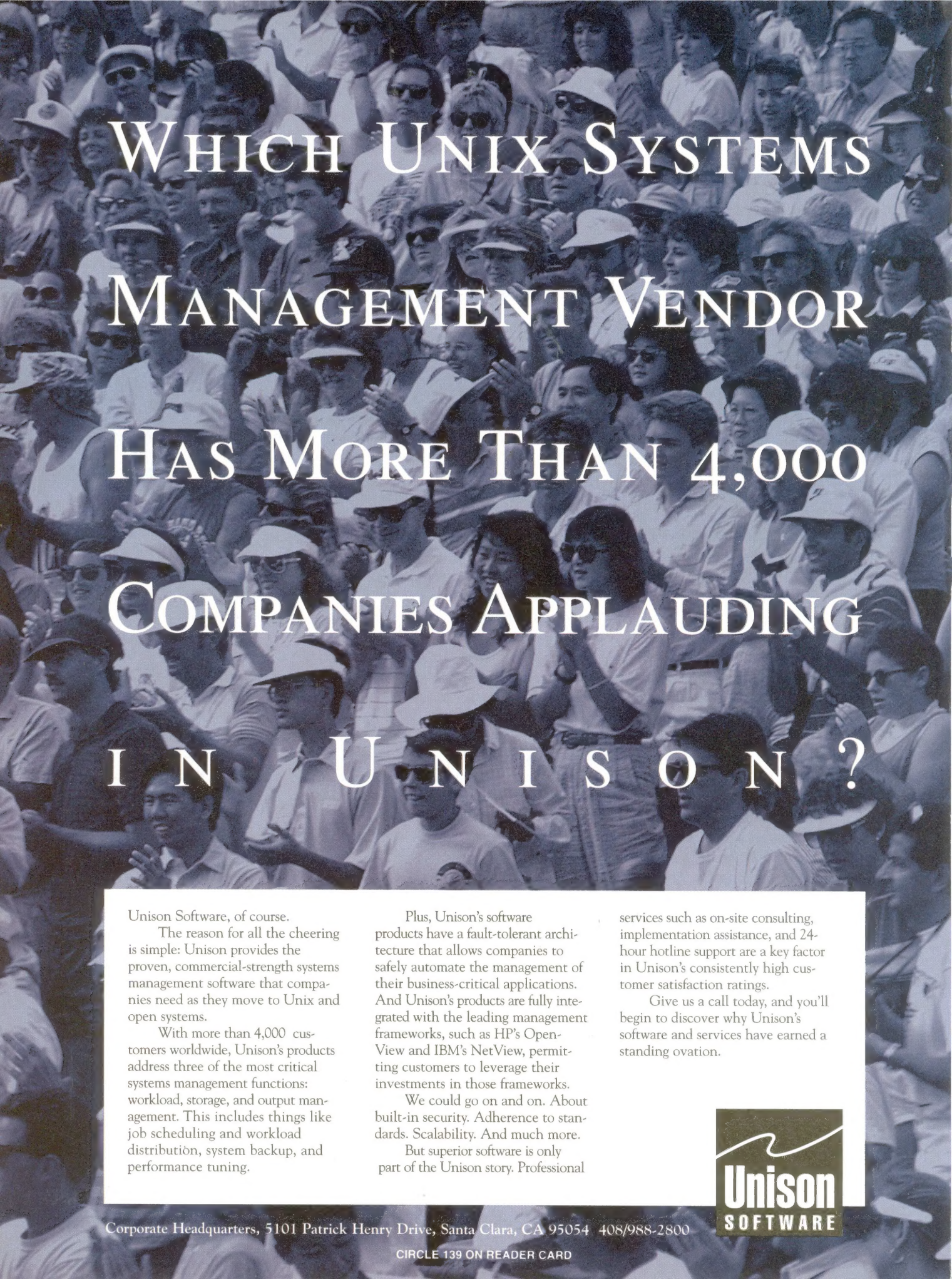


**By Charlie  
Simpson**

*Charlie Simpson*

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# WHICH UNIX SYSTEMS MANAGEMENT VENDOR HAS MORE THAN 4,000 COMPANIES APPLAUDING IN UNISON?

Unison Software, of course.

The reason for all the cheering is simple: Unison provides the proven, commercial-strength systems management software that companies need as they move to Unix and open systems.

With more than 4,000 customers worldwide, Unison's products address three of the most critical systems management functions: workload, storage, and output management. This includes things like job scheduling and workload distribution, system backup, and performance tuning.

Plus, Unison's software products have a fault-tolerant architecture that allows companies to safely automate the management of their business-critical applications. And Unison's products are fully integrated with the leading management frameworks, such as HP's OpenView and IBM's NetView, permitting customers to leverage their investments in those frameworks.

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## INDUSTRY WATCH

George A. Thompson

## LOTUS SURRENDERS ITS POSITION TO IBM

It started with a hostile takeover bid of Lotus Development Corp. on an ordinary Monday in June. Less than a week later, Lotus agreed to a friendly merger with IBM for \$3.52 billion in cash, \$220 million more than IBM's original offer. The sudden turnaround knocks the CA/Legent merger, announced a few weeks before, out of the running for the largest ever software deal.

As this issue went to press, IBM has agreed to pay \$64 per share in cash for all of Lotus' outstanding stock and preferred share purchase rights. "Lotus is a special company," said Lou Gerstner, IBM's chairman and CEO. Just how special remains to be seen, however.

For now, it's a good deal for Lotus shareholders. Lotus' stock price was in the low 30s before the takeover deal was announced. Jim Manzi, Lotus' CEO and president, originally against the IBM bid, will remain with the company as a senior vice president of IBM. And Lotus itself will remain an independent entity.

But historically, IBM doesn't have a very good track record when it comes to developing software — OS/2, XyWrite and OfficeVision come to mind. And the Lotus corporate culture — independent, quirky and non-hierarchical — will not make it any easier for their developers to "be on the IBM team." What if Ray Ozzie, the creator of Lotus Notes, leaves the newly merged company? Lotus has expected Notes, its groupware application for sharing databases and information, to be their next "killer app" a la its 1-2-3 spreadsheet. If Ozzie departs, the merger is much less valuable.

For the last year or so, Lotus has been in the process of turning itself into a communications company with Notes as

its central building block. Many analysts believe IBM wants to get back at Microsoft, which is expected to introduce its own groupware app, called Exchange, to compete with Notes. Others think Lotus' SmartSuite, a group of desktop PC productivity apps will help IBM save OS/2. Special, indeed. ●

## JUST VISUALEYES THE GRAPHICS

HP workstations already well-known for their outstanding graphics performance, got a big boost last month when HP introduced their new VisualEyes series of 3D graphics cards. Shipping this month, the HCRX-8Z<sup>3</sup> (\$5,500) and the HCRX-24Z<sup>3</sup> (\$7,000), respectively replace HP's previous graphics cards — the HCRX-8Z (8 buffer planes) and HCRX-24Z (24 buffer planes). Users with either of the older cards can upgrade by adding a daughter card called the Z<sup>3</sup>, a 3D accelerator, for \$1,500. Performance scales from a PLBsuff93 of 88 to more than 144. The 8Z<sup>3</sup> works on HP's GSC bus or HP's "Runway" bus in the new J-class, according to Tom

Pritchett, HP's visual engineering manager.

The HCRX-8Z<sup>3</sup> takes advantage of HP's Color Recovery technology. Introduced last year, Color Recovery is a rendering technique providing almost 24-bit true color with an eight-plane system, according to Pritchett. "With Color Recovery technology, you can take 24-bits of image data, use a compression algorithm [via a kind of signal digital processing] to store those bits in a frame buffer and decompress them again in real time."

That makes the HCRX-8Z<sup>3</sup> an ideal

Old Product	New Product	New Name	Price
HCRX-8	—	—	\$2,500
HCRX-8Z	HCRX-8Z <sup>3</sup>	VisualEyes-8	\$5,500
HCRX-24	HCRX-24Z <sup>3</sup>	VisualEyes-24	\$7,000
HCRX-48Z	HCRX-48Z <sup>3</sup>	VisualEyes-48	\$16,000

Source: Hewlett-Packard

platform for mechanical CAD customers, says Pritchett, who are happy with the resolution of a 24-plane system but can't afford the cost. "They can save about \$2,000."

Also shipping this month is the HCRX-48Z<sup>3</sup> (\$16,000), HP's new high-end graphics card, replacing the HCRX-48Z. J-class 48Z users can upgrade for \$2,000. Options include video out and texture mapping daughter cards. According to HP estimates, the HCRX-48Z<sup>3</sup> scales from a PLBsuff93 of 200 to 235 and is three times faster than the HCRX-48Z, which it replaces. The 48Z<sup>3</sup> only works on HP's Runway Bus, Pritchett points out. All the new graphic cards are object-code compatible with their counterparts.

The VisualEyes architecture leverages the floating point cells in the PA-RISC 7200 CPU to speed up the graphics pipeline. "It's the key," explains Pritchett. "We can stack up [in

## NOTABLE QUOTABLES

**"More than 20 years after its introduction, its descendant machines are just now entering their obsolescent phase."**

— David Packard,  
referring to the HP 3000 in his book,  
*The HP Way: How Bill Hewlett  
and I Built Our Company*



a parallelizing fashion] two of those floating point cells [for the 8Z<sup>3</sup> or 24Z<sup>3</sup>) or as many as six [for the 48Z<sup>3</sup>]. And he says it is an easy thing to do, because "the PA-RISC CPU designers sit right next to the graphics technology designers. They leverage a lot of ideas back and forth. It's a closely coupled design."

Andrew Allison, editor of *Inside the New Computer Industry* (Carmel, Calif.), finds replicating the PA-7200 floating point technology, "quite interesting" and a "good but unusual move" for HP. "Although it could be a little bit faster, the numbers are impressive," he says. And it keeps HP competitive with the Silicon Graphics Indigo, according to Allison. Silicon Graphics is HP's primary rival in the 3D graphics market.

In a related introduction, HP also announced The Object Caching Card for Evans and Sutherland's Freedom Series, which improves OpenGL graphics performance. ●

## CA BIDS FOR LEGENT

It's suddenly stylish to be buying companies in the network/systems management market. In June, Computer Associates International (CA; Islandia, N.Y.) became fashionable by offering to purchase all outstanding shares of the Legent Corp.'s (Herndon, Va.) common stock at \$47.95 per share. CA signed a definitive agreement which was unanimously approved by the Board of Directors. A wholly owned subsidiary of CA will offer to purchase all outstanding shares of Legent. Following the completion of the tender offer, it is expected that the subsidiary of CA will be merged into Legent.

It's a good move for CA according to Jill Huntington-Lee, president of Brandywine Network Associates (Cinnaminson, N.J.). "By automating UNIX system administration in widely distributed environments, it will help CA fulfill the promise of Unicenter." Users have been disenchanted with Unicenter's monolithic, mainframe style architecture. Legent's XPE architecture, on the other hand, is much more suitable for the kind of flexible distributed management systems now

being implemented in two- and three-tiered client-server models. ●

## HP EQUALS MC<sup>2</sup>

Huh?! And you thought it was E for Energy. Well, maybe in Einstein's cal-

culation. But in HP CEO and chairman Lew Platt's equation, MC<sup>2</sup> — as in measurement, communications and computers — is HP's future. If it's hard to imagine what that means, don't worry. HP is happy to demonstrate with products like the HP M1490A

## Book Review

r — o — u — n — d — u — p

### Focus On OpenView: A Guide To Hewlett-Packard's Network And Systems Management Platform

by Nathan J. Muller,  
1995; CBM Books,  
Fort Washington, Pa.  
ISBN 1-878956-48-5  
\$40.00

Muller brings 23 years of computer industry experience to bear on HP's OpenView. And that serves him rather well as he introduces HP OpenView (it's a framework), explains and dissects its various pieces (there are four) and discusses some of the 3,500 third-party applications available (largely responsible for OpenView's success). While not officially endorsed by HP, Muller enlisted the help of several key HP people and reputable industry analysts which keeps the book free from the all-too-familiar vendor hyperbole.

In fact, Muller isn't shy about mentioning OpenView's shortcomings, citing OpenView's lack of a fully distributed management capability and a common data repository. The preface, briefly but succinctly, puts OpenView in perspective against its competitors — DEC's PolyCenter, IBM's NetView and Sun's SunNet Manager.

There is a chapter devoted to HP OperationsCenter and a chapter on other complementary HP systems management tools: PerfView,

PerfRX, GlancePlus, OmniStorage, OmniBack, OpenSpool and Software Distributor, all which can be integrated with OperationsCenter. Other chapters include discussions of remote monitoring and data collection, problem management, hub management, managing the physical network, managing distributed UNIX as well as NetWare and SNA environments.

In the chapter on distributed management, Muller does spend some time on the integration of Computer Associates' Unicenter and OpenView, an important relationship for OpenView users. But similar discussions are lacking for other OpenView related UNIX management tools such as those from Tivoli and Legent.

The book itself is written in a straightforward style and tone. No doubt a reflection of the 600 articles Muller has written on networking topics. Minor complaints: a better list of acronyms and a glossary.

However, if your looking for a quick overview about systems and network management and the kind of useful information not readily apparent from product brochures, *Focus on OpenView* is book that can serve as both a teacher and a guide.

The book can be ordered via CompuServe (7670,1564) or the Internet (cosgrove@cardinal.com). Or in the United States call (800) 285-1755 or fax (215) 643-8099.





PalmVue System, that combines HP patient monitors, and personal and palmtop computers with wireless communications and printing.

At first glance, the PalmVue looks like an ordinary, run-of-the-mill HP 200LX palmtop with a wireless modem attached. But rather than just exchanging E-mail, checking appointment dates

or noodling with Pocket Quicken, the PalmVue System will help doctors, nurses and other medical personnel to send and receive medical data about patients via wireless transmissions.

Patient data at the dispatch station is encrypted and sent via a radio common carrier to the paging receiver in the palmtop where it is reassembled into a

## The HP Way: How Bill Hewlett and I Built Our Company

by David Packard  
1995; HarperCollins,  
New York, N.Y.  
ISBN 0-88730-747-7  
\$17.00

If you're tired of CEO authors bragging about how they did it, about how their genius made the difference in their companies, then you'll find *The HP Way: How Bill Hewlett and I Built Our Company*, a refreshing change of pace. Written in an unassuming style by HP co-founder David Packard, the book's 212 pages are a quick read.

In the first half of the book, Packard spares few details recounting his early life growing up in Pueblo, Colorado with his lawyer father, and high school teacher mother.

Packard's direction isn't set, however, until he reaches Stanford University as an undergraduate electrical engineering student and gets invited to Professor Fred Terman's graduate class in radio engineering. At Stanford, he also meets Bill Hewlett. The rest, as they say, is history. And Packard makes the most of it by writing about the audio oscillators that were HP's first products in 1938; the incorporation in 1947; its first public stock offering in 1957.

The second half of the book will interest most people who have any kind of relationship with HP today.

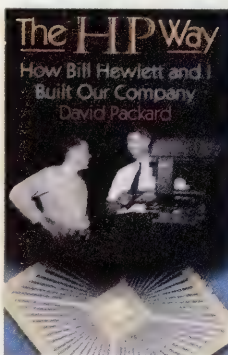
Packard describes HP's transition from a successful Palo Alto instrumentation company into a successful computer corporation hatched in Cupertino. That began ironically enough with an automatic controller for measurement systems known as the Model 2116. Around the same time, Packard writes that "it appeared we might be able to acquire DEC for \$25 million." HP eventually began its computer age with the launch of the HP 3000 in 1972.

Most importantly, as he talks about "the values, the corporate objectives, plans and practices" that make up The HP Way, Packard shares his personal thoughts about corporate management and life in general. Unlike most companies, which practice management by fiat, the HP Way, as Packard describes it, is "management by walking around, and management by objective." It also includes a commitment to

innovative products, quality, mutual understanding and responsibility.

Internally, The HP Way was and still is practiced as both Packard and Hewlett evolved it — with open-plan, doorless offices, flex-time and company picnics. All quite fashionable in the nineties, but revolutionary when HP first instituted them.

Everyone will take something away from this book as Packard (now 83 years old) pauses to tell, not unlike a wise grandfather, stories about and on himself. If your curious about HP (and who isn't these days), then *The HP Way* is a must read.



HP's PalmVue System uses a "doctored" HP 200LX palmtop to receive wireless transmissions of patient data.

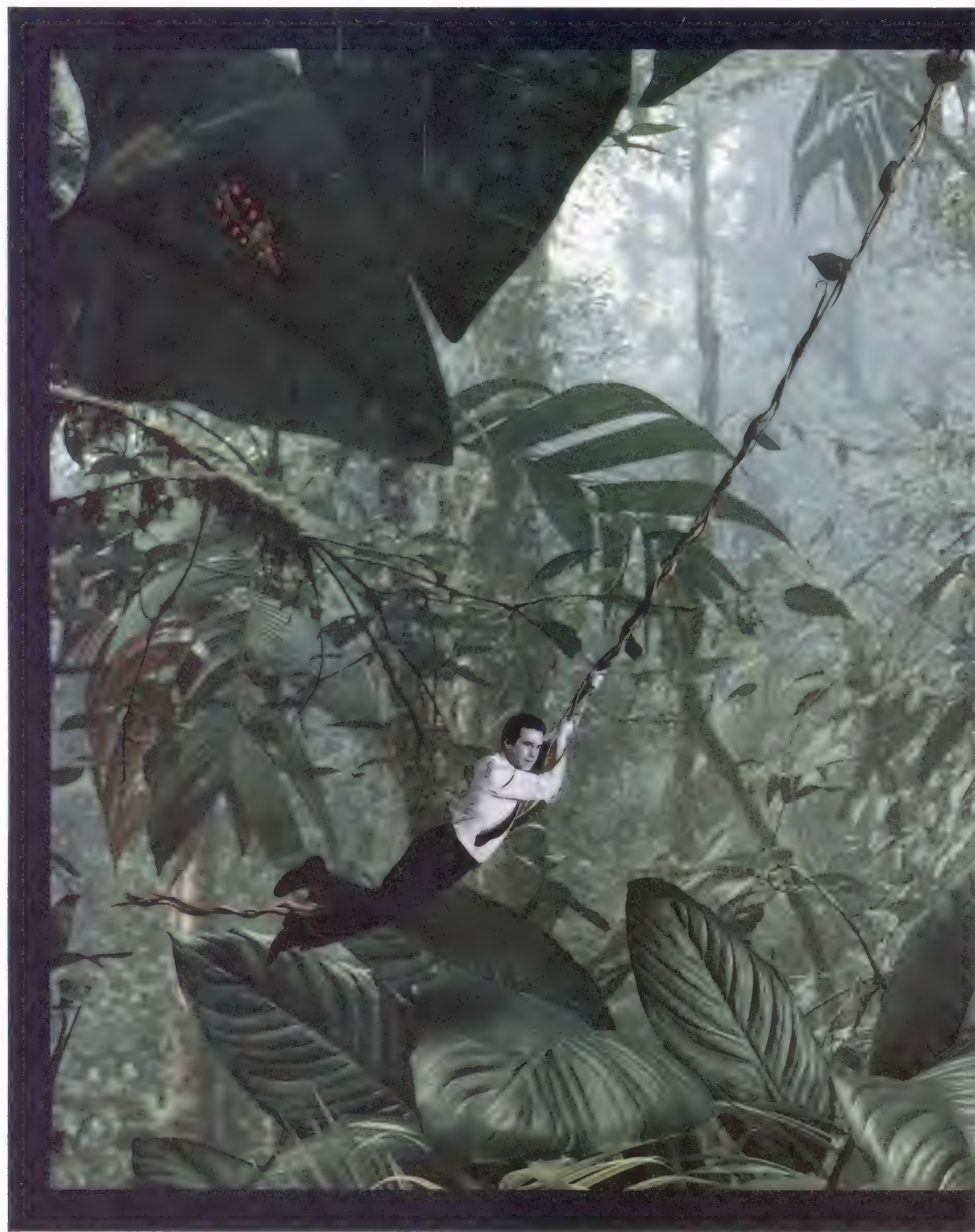
comprehensive display. Designed to be used in community and large teaching hospitals, this "doctored" 200LX palmtop uses a PCMCIA-compliant paging receiver that emits a tone (like a traditional pager) alerting a physician that a message has been sent by the attending clinical staff. Up to 50 messages can be stored for retrieval.

Data Critical (Redmond, Wash.) developed the technology that translates patient data into a form that can be transmitted by the industry-standard paging service, Telocator Access Protocol (TAP), which currently is used by many healthcare organizations and has virtually nationwide coverage. The Paging Network Inc. (PageNet; Plano, Texas) is contracted for and managed by Data Critical. In many instances, PalmVue can be installed and maintained using an institution's existing radio common carrier.

Introduced and available in May, the PalmVue System (\$25,000) includes an HP dispatch station with modem, five palmtops loaded with PalmVue critical care application, an HP LaserJet 4L printer, training and installation.

For more information, contact HP's Medical Products Group (Andover, Mass.) at (508) 687-1501. ●





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Computer Systems



## The Great Windows NT Debate

I've read your [May] editorial several times, and I'm still not sure I understand it. But I'd like to add my \$.02 worth on a couple of items:

■ You've characterized Windows NT as "a new untested, unproven system." Is that accurate? My understanding is that Windows NT is a child of Microsoft Windows and DEC's VMS, neither of which are "new" or "unproven." And Windows NT itself is being beaten upon every day by more users, testers and developers.

My point is that Windows NT didn't just spring out of the void, like UNIX did, and therefore will

probably not require a 10-year ramp up period to become a commercial success, like UNIX did.

■ You've slammed both Oliver Stone and Arlen Specter in the same article, and then compared Windows NT to the "magic bullet." Assuming you could collapse both men's arguments to the validity of the magic bullet theory, your editorial fails to definitely "pick a side" on the issue. However, further into your editorial you go to some lengths to demonstrate the implausibility of a zig-zagging bullet, which, by your comparison (Windows NT-to-magic bullet), would seem to have you affirming Stone's

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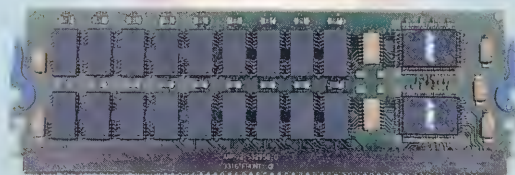


# PNY LOADS HP WORKSTATION MEMORY WITH THE WORKS:

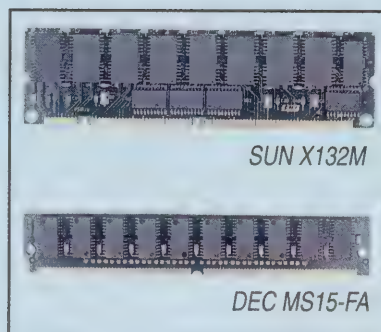
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CIRCLE 176 ON READER CARD



# LETTERS

position and calling him a liar at the same time.

■ In the statement “fired from a \$12 rifle,” I’m sure you are making reference to Lee Harvey Oswald’s infamous Mannlicher Carcano. I *believe* Oswald paid \$19 for the aforementioned rifle.

Steve Harris

*According to Gary Mack, archivist at the 6th Floor Museum, the rifle itself cost about \$12 but the purchase order paid by Oswald was \$19.95, which included scope, clip, and shipping and handling. Thanks for your letter.*

I just wanted to take the time to say “Bravo!” in reference to your editorial in the May issue. For once it’s nice to hear that not all is for nought in

regards to the UNIX operating system. Your analogy using the “magic bullet” theory was right on the mark and the article overall was objective. I liked it. I suppose it’s possible that my letter would have a different slant if I worked in an environment other than UNIX, but that’s not the case and I wouldn’t have it any other way.

Erik Palomba

Technical Support Engineer, PDC  
Services

A recent IBM ad in *Business Week* stated that some evaluation by a prestigious organization had determined that IBM has the best UNIX. HP and Sun could no doubt argue that they have the best UNIX.

I have not yet seen an ad from HP or

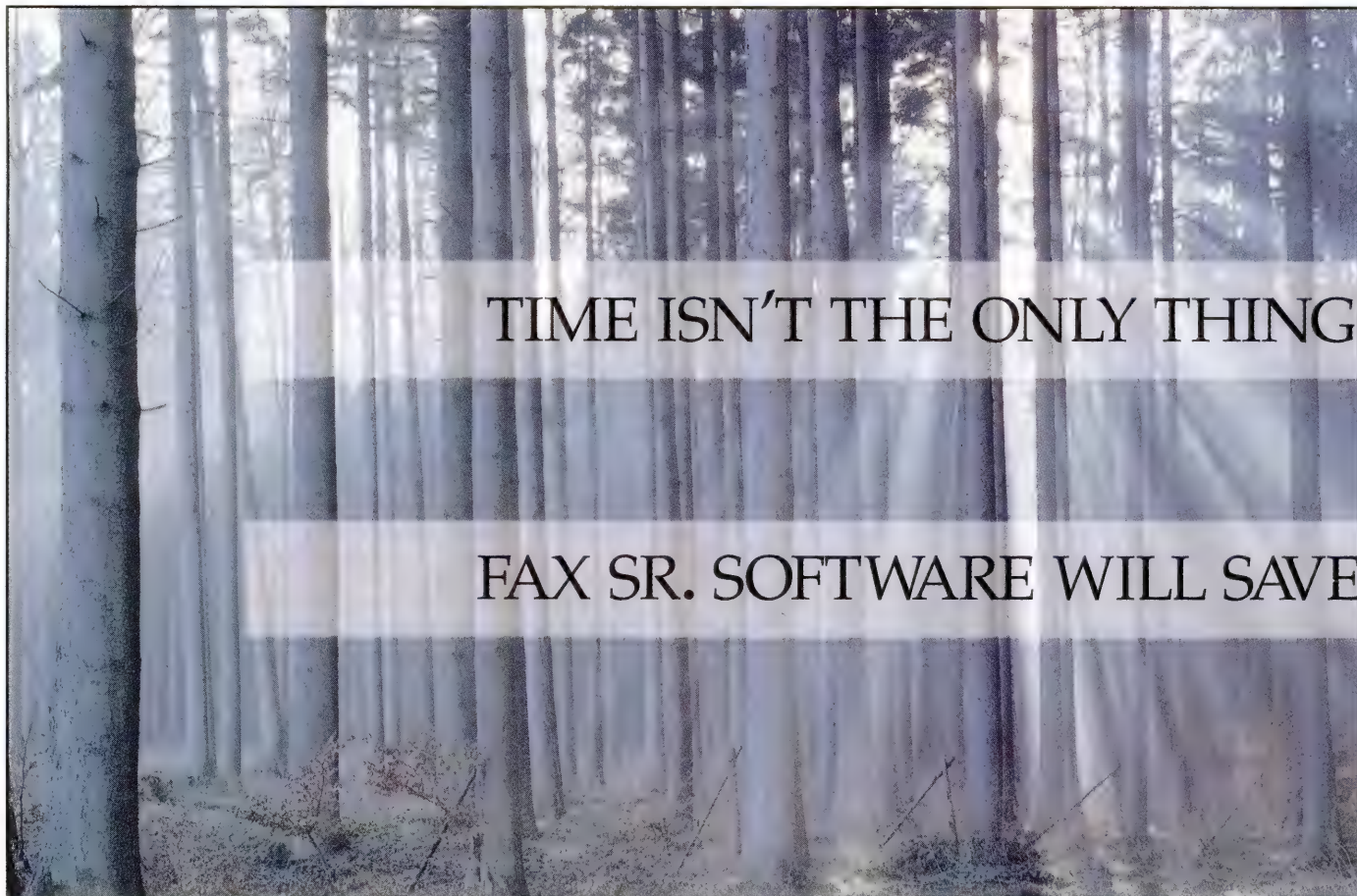
Sun claiming that their UNIX is exactly like Sun or HP UNIX. They are all the best, and they are all different.

Imagine you are the CIO of Chase Bank or Boeing or GM. Bill Gates calls you up and says “How would you like, five years from now, to have every computer in your company running exactly the same operating system?” Would you be interested?

Dudley M. Jones

Senior Member Engineering Staff,  
Princeton, NJ

I just read your editorial in *HP Professional*. Are you suggesting there is ever going to be a server OS of choice? What would it be? Not the current UNIX. It’s not a single operating system. From where I sit, different UNIX





implementations sometimes seem almost as different as NT and OS/2.

If you aren't prepared to continue to support multiple operating systems and multiple clients, then you aren't prepared. I'm not saying strategy, direction and consolidation (where possible) aren't desirable. It's just a Newton and a Silicon Graphics are different types of workstations. Same is true for NT and UNIX; it's just that there's a lot more overlap.

Stop bashing NT and give us some useful information or opinion.

Mark Birnbaum  
Information Services Manager,  
Sims Deltec Inc.

## GENDER-NEUTRAL PRODUCT NAMES?

Regarding the splash "They Got the Look (and Feel)" in the May issue's Industry Watch: Is anyone else out there bothered by the names Bob and TED? Can't someone come up with a Pat or Chris or other simple non-sexist name for a new technology?

Susan Dorsky  
Software Engineer

used everyday are being distributed. Computers don't get used everyday.

I guess none of the Amway distributors made it past the front door with you or else you'd understand that. But then again, maybe you do and you're just pulling our legs.

Alan Bell  
Lab Supervisor,  
Computer Science Dept.  
Cal Poly State University

## RESELLING THE BIG SELL

The idea behind the Multilevel Marketing approach in Amway [mentioned in & Another Thing in the March issue], and the reason that it works, is that consumables which are

HP Professional welcomes comments from its readers. Letters may be edited for brevity and clarity, and should be addressed to HP Professional, 1300 Virginia Dr., Ste. 400, Fort Washington, PA 19034. Fax number: (215) 643-4827. Internet address for staff listed on the masthead: [LASTNAME@CARDNAL.COM](mailto:LASTNAME@CARDNAL.COM). Please include a phone number for verification.

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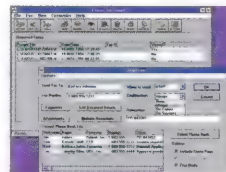
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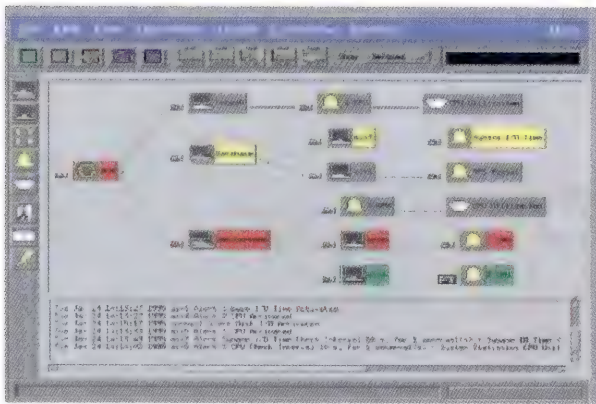
  
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CIRCLE 130 ON READER CARD



# BGS' BEST/1 Pieces Together The Puzzle



## BEST/1 PERFORMANCE ASSURANCE

- Supports SunOS 4 and Solaris 2.x, IBM AIX 3.2.5 and 4.1, and HP-UX 9.x
- The Oracle and Sybase support gathers RDBMS performance statistics
- Entry price is \$25,000 for the management console

### BGS Systems Inc.

128 Technology Center  
Waltham, MA 02254  
tel: (617) 891-0000  
fax: (617) 890-0000

CIRCLE 351 ON READER CARD

**M**ost UNIX performance and capacity management products provide only a piece of the total capacity management puzzle — they provide real-time monitoring or performance trending as well as the ability to do some “what if” modeling. When Southern California Edison (Rosemead, Calif.) looked for a performance trend analysis tool to analyze CPU utilization on over 35 RS/6000 servers, most other products had real-time monitors, but they couldn’t group the data into workloads.

In that scenario, according to Elaine Wynn, UNIX Systems administrator, “you’re forced to look at every single process. Well, you might have hundreds of processes running

each day by different users. With BEST/1, you’re alleviated from that kind of detail.” BEST/1 Performance Assurance is available from BGS Systems (Waltham, Mass.). Its new version, Release 4, includes a performance monitor; integrated Oracle and Sybase facilities; and support for SunOS 4 and Solaris 2.x. BEST/1 already supports IBM AIX 3.2.5 and 4.1, and HP-UX 9.x.

Southern California Edison is a Sybase shop migrating over 30 applications off mainframes. With BEST/1 they group what’s running on the server into workloads, thereby seeing what Sybase is doing as a whole. The new release has drill-down capabilities with Sybase.

They’ve been using BEST/1 since November 1994. The software was easy to install and usable out of the box. “We’re not even using half the reports that are available,” says Wynn. BEST/1 has X Windows and PC components.

The new BEST/1 Monitor uses intelligent “alert and display” agents to find and diagnose problems as they happen. The monitor can be used by itself or along with BEST/1-Visualizer, the performance database, or BEST/1-Predict, the “what-if” modeling tool for sizing, test-driving and

planning the capacity of applications. The Oracle and Sybase support gathers RDBMS performance statistics. Informix capability is currently under development.

“There’s tabular and graphical reports. Not all people want to see those graphs. Some people want just the numbers. BEST/1 has both,” says Wynn.

According to Michael J. Toomey, senior manager of product marketing at BGS Systems, the normal environment for BEST/1 is someone who has multiple UNIX servers installed. “You can install it on all of your servers. You have the option of the complete management suite or just the pieces.

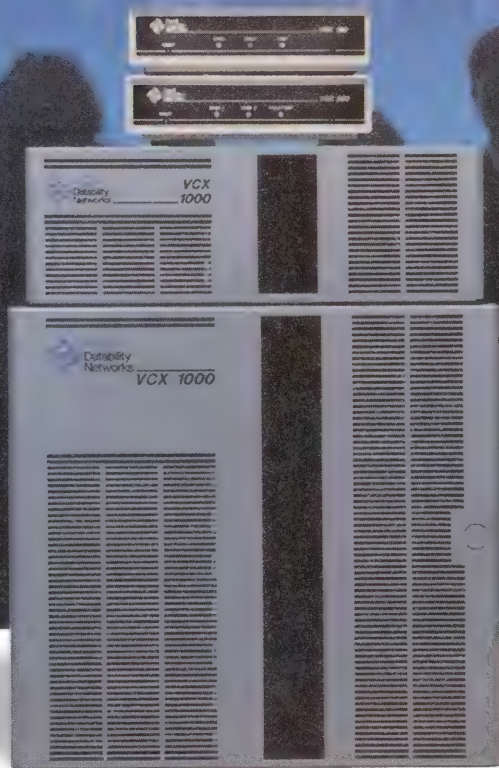
The company plans to release BEST/1 for Windows NT in 1995. Future development also will expand platform support to AT&T, SNI and DEC in the next three to six months. Network measurement and reporting is planned for late 1995.

Pricing is modular. The entry price is in the \$25,000 range for the management console piece. The agent software ranges from a few hundred to \$1,200 each.

—Jim Esch,  
Contributing Author



# HP USERS — GANG UP WITH VCX



## AND EXPAND YOUR WORLDWIDE CONNECTIONS!

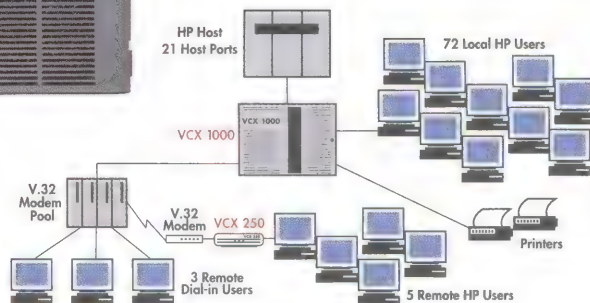
Has your business grown to the point that you now have multiple remote sites? What do you do?

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The VCX is an extraordinary port concentrator that extends the reach of your HP system directly to all of your remote offices. This is done without changing your existing communications network — and without ever adding more ports to your HP host. You connect more asynchronous terminals, printers and PCs in your network than computer ports available. AND SAVE MONEY!

### Plus, VCX does port contention.

Although you can only connect the same number of concurrent users on your host that you are licensed to support, with VCX, everyone has a chance to grab those connections. The host ports are shared over your network — and if a port isn't available, you're put into a queue and told of your position. If you don't have time to wait, just select another resource or service on your network. AND SAVE TIME.



And with VCX, modem pools for dial-in users are no problem. Depending on your location and tariff, the VCX can provide the lowest cost trunk to get remote users on your host computer. Protocols such as ISDN, Frame Relay, X.25, Leased Lines and Dial-Up Lines are all supported.

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# Faster Than A Speeding Bullet



## RAPID TAPE

- Data can be mirrored to up to five drives simultaneously
- Support cross-platform compatibility with no need for device drivers
- Pricing starts at \$24,750

### Andataco

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fax: (619) 453-9294

CIRCLE 354 ON READER CARD

**T**ape storage is cheap. Tape storage is reliable. But, tape storage is slow. That is, until Andataco (San Diego, Calif.) introduced their Redundant Array of Parallel Independent Device (RAPID) technology which provides up to four times the capacity and data transfer rate of a single tape drive.

According to Michael Meyer, chief software scientist at Science Applications International Corp. (SAIC; San Diego, Calif.), it was the speed and capacity of the RAPID Tape products that got his attention when he started to evaluate tape products for a possible contract with a health-care company. "The RAPID Tape products have a projected capacity that should exceed 160 GB in the near-term," Meyer says. "And that is better

than any other product out there now."

Meyer is currently using an evaluation stacker model of the Model 6000 DLT Tape Array, and has plans to purchase the product within a six month time frame. RAPID-Tape Arrays, available in three models — Model 4000 DDS 4mm Tape Array, Model 8000 8mm Tape Array and Model 6000 DLT Tape Array, use this new tape technology and support multiple tape technologies for UNIX workstations and servers.

The RAPID-Tape family offers several choices — complete systems or controller-only versions which integrate with a user's existing tape drives. With RAPID stacker systems, 560 GB of unattended backup is possible, and 80 GB capacity with an array of RAPID-Tape DLT drives. A parallel tape architecture, similar to RAID architectures, is also present.

RAPID-Tape consists of an array interface and an array controller. Five single-ended SCSI tape drives channels, up to four for data and one for parity, are also included in the interface. The data exchange port, with one single-ended SCSI tape drive channel, facilitates media format conversions to and from devices on the array channels.

RAPID-Tape systems are

compatible with all major operating systems and backup software utilities and support cross-platform compatibility with no need for device drivers. SCSI-1- and SCSI-2-compliant interfaces provide plug compatibility with UNIX servers and workstations from HP, IBM, Sun and SGI.

RAPID-Tape has a menu-driven display for set up and configuration. The front panel, with its four-line by 20-character display and four-button key pad, allows you to monitor the system as well as select the operating mode and invoke offline operations. There are hot-swappable, user replaceable tape canisters on Model 6000 and power supplies on all models.

Pricing starts at \$24,750 for a 32 GB configuration with five 4mm DDS2 tape drives, a RAPID controller and a host channel. A 56 GB configuration with five 8mm tape drives, a RAPID controller and a host channel costs \$36,600. An 80 GB configuration with five DLT tape drives, a RAPID controller and a host channel costs \$52,750.

—Deborah Schwartz,  
Assistant Editor





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# Bust The Memory Block

PNY Electronics Inc. Pumps Up The Volume For Workstation Memory



"We are converting our SIMM designs to 16 Mbits in 1995. And we are dabbling in 64 Mbit technology."

Joe Klein  
Director of R&D  
PNY Electronics Inc.

200 Anderson Ave.  
Moonachie, NJ 07074  
tel: (201) 438-6300  
fax: (201) 438-9097

CIRCLE 355 ON READER CARD

**R**emember when 64 KB was a lot of memory? Did you ever think you would need that much memory? Remember when 256 KB was a lot of memory? Did you ever think you would need *that much memory*? Remember when 1 MB was a lot of memory? Did you ever ... well, by now you probably see where this is heading.

Windows95 is expected to require at least 8 MB. And Windows NT demands at least 16 MB. But whether its PCs or servers running DOS or Windows95, or workstations, which have always been memory-challenged, you are going to need more memory. "And there appears to be no end in sight," says Ray LeBlanc, vice president of sales and marketing for PNY Electronics Inc. (Moonachie, N.J.).

Of course, some demand comes from the sales of new PCs and workstations. But according to LeBlanc, the bulk of the memory demand [in the installed base] last year has been driven by software. That's why PNY, a near-exclusive PC commodity DRAM memory supplier since 1985, has expanded into the resale market (VARs and distributors) for workstation memory products.

"We've been selling workstation memory products since the second quarter of 1994," says LeBlanc. PNY provides

DRAM for DEC VAXstations, Sun SPARC 10s and 20s (mostly in Europe and Southeast Asia) as well as for HP 9000 and HP 3000 systems. According to Joe Klein, director of R&D for PNY, most HP 9000 users are upgrading with 128 MB and 64 MB kits. SRAM (mostly for L2 caches) and flash SIMMs (in demand by printer vendors) fill out the PNY product line.

Competition for the privately-held PNY comes primarily from Kingston (Fountain Valley, Calif.), a \$900 million company, which entered the market for workstation memory last year. According to PNY figures, 1994 sales revenues were \$305 million. That's up 53 percent from 1993, and more than three and a half times 1992's \$86 million in sales. Twenty five percent of PNY revenues come from outside North America.

In 1995, PNY expects to be a \$500 million company and is "seriously investigating a public offering," says LeBlanc. "We do virtually all our manufacturing in house. Most of our competitors use subcontractors. And, we have more module manufacturing capacity than anyone else in the world." As for quality standards, PNY has been ISO 9001 certified since December 1994.

While there is still strong demand in 4 Mbit DRAM,

PNY is converting their SIMM designs to 16 Mbit in 1995. "And we are dabbling in 64 Mbit technology," Klein says, "but the pricing is so high and the availability and reliability is unrealistic for the commodity and workstation markets right now."

New trends include something called SODIMMs (Small Outline Dual Inline Memory Module) which have half the profile of regular SIMMs. A late 1994 development, explains Klein, SODIMMs are replacing PCMCIA memory upgrades. "They are cheaper to manufacture and to build, therefore they are also cheaper for the customer to buy."

Until recently, supplying workstation memory has been filled by niche players with smaller companies (under \$100 million) providing product. But when larger companies like Kingston and PNY move into a market, "the smaller players are going to struggle," says LeBlanc. "We have a 6 to 10 percent cost advantage."

Consequently, LeBlanc expects the number of workstation memory vendors to decline to three or four, down from about 10 or so now. "The workstation memory market is going to get pretty interesting over the next couple years."

—George A. Thompson,  
Technical Editor



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# The Magic of network printing

*Hey Rocky,*

*Watch Me Pull*

*A Rabbit*

*Outta My Hat ...*

Houdini. Blackstone. Copperfield. Penn and Teller. Bullwinkle. Master magicians practicing the mysterious art of illusion, taking their secrets to the grave or passing them on to a select few. Do you sometimes feel there is a secret society that knows the key to network printing and you aren't a member? Well hocus pocus, presto chango. Welcome to the club.

Conjuring up a printing network requires no supernatural powers. In fact, there are a few natural ways to accomplish it. They include print adapters, print management software and connectivity software.

You see, the reality of the performance demands of printing must be tailored to the tasks of workgroups within the enterprise. For example, the needs of a marketing department may require PostScript printing from Macintoshes. Sales may need label printers. Software developers might need line printers for code output. Engineers may need plotters. Accountants may need PCL on HP

LaserJets. And to make matters worse, each department's network is running on different protocols: AppleTalk, TCP/IP, IPX — you name it.

Fortunately, there is a solution. First, you can start at the end of the printing line, with the printer itself. Printers can be made more adaptable by providing support for direct network connections via internal network interface cards. HP's JetDirect line of network interfaces are the most popular instance.

## THE INS...

INTERNAL CARDS ARE available for the HP LaserJet 4Si, 4Si MX, IIISi, 4 Plus, 4M Plus, 4 and 4M models; HP PaintJet XL300 and XL300/PS; the HP DeskJet 1200C and 1200C/PS; and the HP DesignJet 600 and 650C plotters. You install these cards in the printer's expansion slot and print from anywhere on the LAN.

The JetDirect family supports major operating system protocols, including: Novell NetWare 2.15c, 2.2, 3.121, 3.12, 4.0 and 4.01 (IPX/SPX); Microsoft LAN Manager 2.0C, 2.1 and 2.2 (DLC/LLC); IBM LAN Server 1.3, 2.0 and 3.0; HP-UX V9.x; Solaris 2.2 and 2.3; SunOS 4.11, 4.12 and 4.13; SCO UNIX V/386 3.2.2 and 3.2.4; IBM AIX 3.2.5 (TCP/IP); Apple EtherTalk System 6 and 7; and Apple LocalTalk System 6 and 7. JetDirect printers also are compatible with SNMP agents for network management applications.

The JetDirect interface has the advantage of unclogging the bottleneck of a parallel port; data gets to the printer in LAN-sized packets at the speed of the network. Network server load is

**Jim Esch**



*To share printers,  
you could do complex  
spooling and spend a  
fortune on training and  
implementation.*



**Or not.**

**Your problem.** For increased productivity and hardware utilization, you need to share printer resources on your HP 3000-based network. But the spooling software available today doesn't always match your networking needs. It usually involves complex spool management procedures, and requires expensive, time-consuming implementation and training.

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- Windows NT •LAN Manager
- Banyan Vines
- Any platform that talks lpr/lpd

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## Magic

subsequently reduced as well. The printer can switch automatically between diverse protocols. Another benefit is that you can place the printer anywhere on the LAN, because it's connected via standard network cables. The JetDirect card includes LPD (line printer daemon) support for UNIX and Novell NetWare security features like encrypted passwords and NCP Packet Signatures, and flash EPROMs for software upgrades.

A JetDirect-connected printer can be controlled via the JetAdmin utility, a suite of HP software management utilities, available for UNIX and NetWare. The JetAdmin utility loads and distributes printer drivers, configures new printers by means of a GUI, providing access to printer front panel settings and the monitoring of printer status. Network statistics and diagnostics are easily fetched because the printer is a network node. JetAdmin also can set and lock user access rights. JetAdmin for UNIX is a host-based application requiring HP-UX 9.x, SunOS 4.1x and Solaris 2.2 or 2.3 on Ethernet and Token Ring TCP/IP networks.

HP isn't the only vendor adding multiprotocol power to their printers. For instance, Dataproducts' (Woodland Hills, Calif.) Virtual Printer Technology takes a single printer and sets it up to act like it's up to 64 individually-configured printers. It supports Novell IPX, UNIX TCP/IP, Macintosh EtherTalk and DEC LAT (Ethernet only). Twenty network operating systems (NOS) are supported, including HP-UX A.B8.05 and A.0900-A.09.03.

Several parameters are controllable: emulation mode, resource accounting, priority level, default paper hopper, paper size, default paper output stacker, duplex/simplex operation, bidirectional mode and line termination mode. In theory, a user has a customized printer setup that may differ from a user down the hall on a different platform

altogether, yet both use the same printer. Dataproducts builds the Virtual Printer Technology into their Typhoon Series laser printers.

### ... AND OUTS OF PRINTING

ANOTHER APPROACH to making your network printing more flexible involves using a multiprotocol print server attached to a printer's parallel or serial port. Print servers, like interface cards, turn a printer into a network node. A multiprotocol print server allows printing through Token Ring or Ethernet, regardless of platform or printer type. Consequently, you can't be locked into a particular printer model.

In fact, an external print server can leverage your existing printers and add features they don't natively have. It's much cheaper to update or replace a print server, about the size of a video tape cartridge, than it is to replace an entire printer. And the printer is going to be obsolete before the printer adapter.

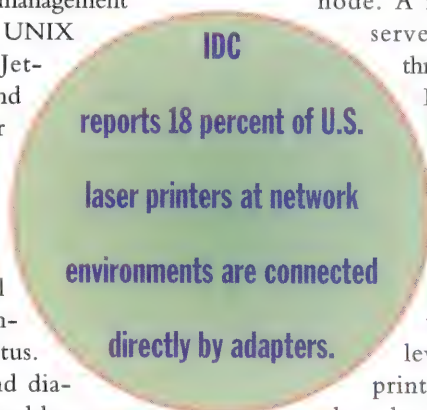
Even though you may suffer some throughput speed loss compared to an

internal card, there will be a vast improvement over standard parallel or serial printing off a dedicated host PC.

What are the main benefits to external print servers? For one, you have increased printer sharing and accessibility, printer management through SNMP, increased throughput by reducing the load off workstations and file servers (especially if the print server contains a RISC processor) and increased reliability versus a PC-based server. Print servers have a mean time between failure (MTBF) rating that's 10 times greater than PCs. Besides that, they're cheaper.

The features you should look for in a print server are: interoperability (does it support multiple protocols to meet my present and potential needs?); number of printers supported per server; ease of installation; and advanced features like adjustable data streams from specific applications, bin switching, RISC technology, SNMP and software upgrades through flash memory.

A server like the AXIS NPS 550 RISC offers simultaneous multiprotocol printing; two parallel ports and one serial port; and compatibility with TCP/IP, Novell NetWare, LAN Server, LAN Manager, Windows NT, Apple EtherTalk, 10Base-T and 10Base-2. The 32-bit RISC processor is integrated with Token Ring and



### GAIN, NO PAIN

In November 1994, HP's General Systems division and Xerox announced an agreement to cooperate on bringing mission-critical production printing to HP-based networks. But what does that mean in an area that has previously been dominated by the IBM mainframe platform.

To explain, Andy D. Sachs, director for Strategic Alliances at Xerox (El Segundo, Calif.) cites an example of what he calls "document pain." "We've had situations where customers have had to send print files across the country or across the world, back to an IBM mainframe in order to accomplish the print and then have that print be distributed by [surface mail] back to the end user. That's what we call 'document pain.'" In other words, instead of print and distribute, you can distribute, then print.

Sachs says printers used to be tied to very specific computing platforms. They were not widely accessible by the rest of the enterprise. Customers are asking for enterprise-wide access, but at the same time they have the same strict requirements they've had in the past relative to price/performance, security and integrity.

The HP/Xerox strategic agreement will integrate Xerox's production laser printing systems into HP 9000 networks. Xerox's production printers offer high-speed cut sheet printing, highlight color, 600 dpi resolution, multiple input trays and multiple fonts, forms, logos and graphics. HP and Xerox are presently working with Quest Software to develop a print server interface.—JE





*Multiprotocol network print servers provide flexibility through Token Ring or Ethernet.*

Ethernet interfaces. RISC is good to have for demanding graphical-oriented applications with complex page descriptions. AXIS is working on a GUI to enhance the existing SNMP features of the product.

Ease-of-use is one of the more important criteria for print server customers, says Steve Simpson, executive vice president of sales and marketing at Extended Systems Inc. (Boise, Idaho). Simpson used to be the general manager of HP's Boise Printer division, and was responsible for the midrange and low-end LaserJet business.

"Much as I'd like to think that print servers are the center of the universe, I know that's not the case," says Simpson. "I think the key thing is that our customers don't want to have to think about print servers, that they want them to be easy to install and have them work easily, that their networking is protected, that there's an upgrade path using flash memory or that there's even upgrade programs."

Simpson also sees a push for TCP/IP away from NetWare and other NOSes, as well as an increased popularity for infrared technology. One hidden market niche has to do with Banyan Vines. "Even though Banyan has a small market share, they tend to be very large networks — enterprise-wide — and we're seeing many more users being added to those networks." Extended Systems markets ExtendNet MPX, a multiprotocol network print server that can connect four printers anywhere on a network (up to 500 feet away). The product

includes flash memory and Windows-based management utilities that allow centralized control. Network administrators can now install, manage or upgrade their utilities from one location.

Joe Toste, director of marketing at MiLAN Technology (Sunnyvale, Calif.), sees heterogeneous networks as the primary need for customers today. "Our focus is the multiprotocol market, those heterogeneous operating system environments like TCP/IP, IPX and AppleTalk." Since 1991, MiLAN has been producing multiprotocol print servers to meet this demand. Their FastPort 3100 Ethernet network print servers offer two ports, support for TCP/IP, IPX, AppleTalk and OS/2 environments, and a throughput of up to 210 KBps. Network flash EPROMs allow firmware upgrades over the network.

Each unit of the 3100 Series includes a modular network uplink in the back, enabling network managers to connect each FastPort to any Ethernet cabling — including fiber. MiLAN provides UNIX host software for users to customize their printing setups. A menu-driven installation script, ASCII-

### HOW DO THEY DO THAT?

Two types of standards are essential to provide continued growth in network printing applications. The first is ISO DPA 10175, a network-based print management spooling architecture that supports standardized services such as job submission, viewing a job queue, notification and matching job requirements with device capabilities. The standard is actively under study.

The second type is not an official standard per se. It's the realization that certain de facto page description standards have coalesced depending on computing level. At the office environment, there's PCL and PostScript. At the datacenter level, there's Xerox's Metacode and IBM's AFPDS. The open systems shift is bringing a convergence of the two levels. Soon, all of the page description languages will need to be supported on enterprise-wide, UNIX-based networks.

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electronic forms  
and highlight  
color, just buy  
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## Magic

to-PostScript conversion, and support for Adobe TranScript and Sun's NeWSprint are included. Users can print to FastPort-attached printers with the host software or by using LPD directly.

According to Robert Fazen, vice president EasySpooler (Dallas, Texas), "Print management is a burgeoning market, which sounds strange. Why haven't users asked for this before?" Fazen maintains it's the migration theory. "Former mainframe users expected the same control of print management on minis and mainframes on UNIX platforms; but it isn't there."

EasySpooler, from EasySpooler, lets users manage print queues directly without intermediate software. It communicates with HP JetDirect cards and Axis print servers. EasyNet sends servers. EasySpooler targets companies that have large print jobs, whether numerous jobs or single large documents.

### PRINT MANAGEMENT SKILLS

MAYBE PRINTER adapters aren't your problem. Maybe you need better management of your existing print resources. Especially on UNIX platforms, printing may be more of a headache than it should be. Mainframe printing has traditionally been more flexible and powerful than UNIX. Simple operations like restarting a job at any page; report viewing before, during and after printing; and keeping a job in a queue by setting a purge delay time — are not to be taken for granted under UNIX.

The mission isn't as easy as it sounds. According to one product manager, "we've missed the boat with regard to UNIX print management and multiple UNIX vendors. Now they're throwing other OSes in there, and the biggest player that's going to share time with UNIX is going to be NT. And you can't forget about Novell either."

Multiprotocol printing in itself adds a layer of complexity that wasn't previously there in the days of mainframes. Downsizing has its hidden costs: training, support, maintenance — all of them more difficult in a multiprotocol environment. Then there's the struggle between vendors who are differentiating themselves and users who demand standards to make all products work together better. While standardization is improving with the convergence of SNMP, TCP/IP and SQL, analysts expect the market to keep plunging ahead of the standards.

Despite the shortcomings and obstacles, there are many products available to better control the network printing environment.

HP offers OpenView OpenSpool network print-administration software, a "workgroup-to-enterprise" print-management and troubleshooting tool. OpenSpool extends its end-user print-request functionality to the multiplesite enterprise for selecting fonts, forms and paper size. Users can print documents on any device on the network, even from remote sites. They can monitor or cancel remote print jobs, an alternative to intracompany faxing and document

*21 users need data.*

*That means  
printing 93,109  
pages of reports,  
assembling and  
delivering them by  
2 o'clock.*



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### NOTHING UP YOUR SLEEVE...

To properly assess print server performance, you need to take two parameters into consideration: print server bandwidth and printer I/O bandwidth.

Print server bandwidth is the maximum speed that the print server can possibly send characters to the I/O port of the printer, regardless of port type. This should include all network overhead. Beware that manufacturers don't mislead you by claiming that the hardware throughput of the DMA channel is the actual print server bandwidth.

Printer I/O bandwidth is the maximum speed that the printer's I/O port can receive data. Newer printers that boast of high-speed parallel ports (100 to 200 KBps) are quoting the printer's I/O bandwidth. Customers should evaluate print servers on the printers that they're meant for, otherwise bottlenecks could still occur. For example, if you've got the hottest, fastest print server attached to a printer with a slow parallel port, you're actual bandwidth is going to be limited to the speed of the I/O port.

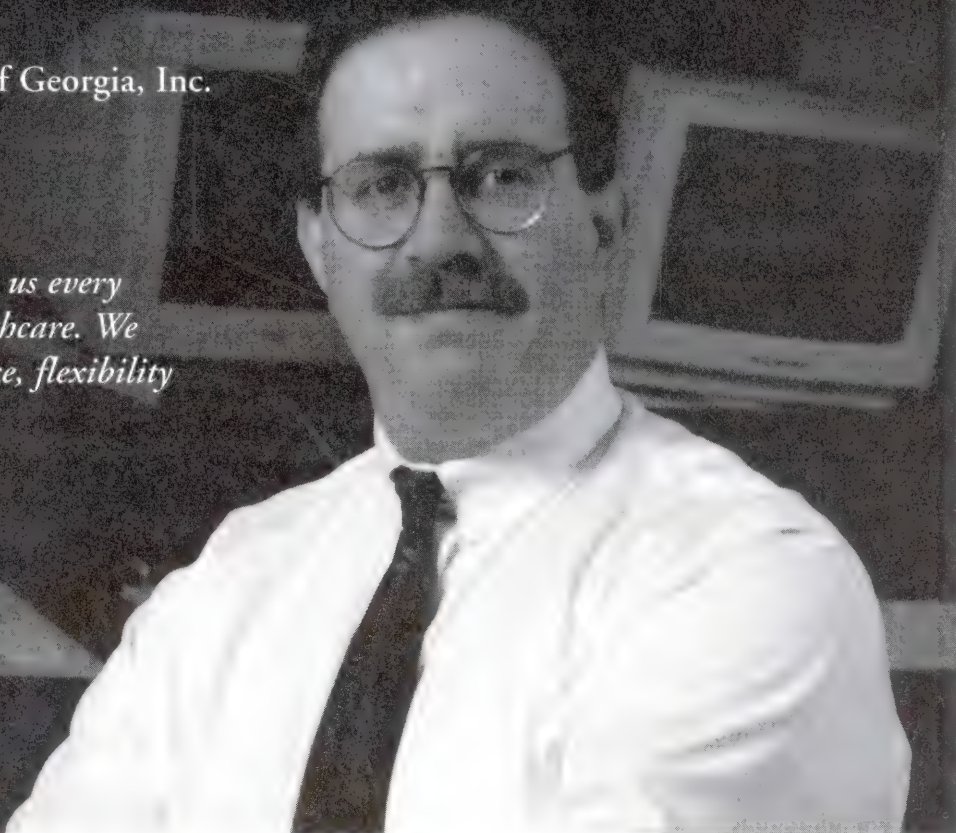


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distribution. Intelligent software agents enable the operating system to identify and react to events automatically.

OpenSpool, as you might expect, is closely integrated with HP OpenView OperationsCenter. This means that printing activities and task management can be managed from a single location

IDC

**says the network printer adapter market grew over 50 percent in units and 40 percent in value from 1992 to 1993. And the Ethernet market was responsible for 80 percent of sales.**

through a graphical print-status icon. Administrators can determine the status of individual print requests; print requests generated from within an end-user application; and use the built-in banner support to identify print requests and create print accounting reports and print logs. OpenSpool is integrated within HP's OperationsCenter software services, along with OmniBack II (distributed backup) and OmniStorage (hierarchical storage management).

Control over print resources is definitely the key for Robby Wadzinski, product manager for UNIX systems software at Digital Controls Corp. (Springboro, Ohio). Administrators want to control things from the one machine where they are. Digital Controls offers the LP Plus Print Management System to accomplish this. It emulates the LPD/LPR protocol as well as features like viewing reports, counting pages and reprinting as many times as you want.

"Let's say you've got 10 machines, and each of them has a printer attached to it — all hooked together by Ethernet. If you put LP Plus on each and every host, you can assume that host," says Wadzinski. "In other words, if a printer gets jammed, to remedy the problem you can call up

that host without having to do RLOGINS or Telnets. You can control that host print operation." The product runs on HP-UX, AIX, SCO UNIX, Sun, Solaris, DG-UX and any Intel SVR4 machines. It has a character-based command line interface and competes directly against Software Clearing House's (SCH; Cincinnati, Ohio) SCH Print.

While products like LP Plus are targeted to the midrange user, Computer Associates' (CA; Islandia, N.Y.) Unicenter plays to the enterprise level. Unicenter systems management software, while encompassing much more than simple print management, does have important features that serve the network printing needs of customers.

In March, HP and CA announced Unicenter for OpenView. Jay Yesselman, director of systems strategy at Computer Associates, says "Unicenter enables you to secure your print resource, so that only users who have the proper security clearance can use the resource. For example, if one of the printer queues was important for accounting on certain days of the month, then all other access to that device would be shut off by security rules. The same thing could be for a documentation printer if they had a critical job to do." Unicenter controls who has access and when. Report distribution is an added capability. In a policy-based manner it sets up what pieces of reports get distributed to designated printers at designated times.

As a top-down enterprise management product, CA Unicenter tries to make all the heterogeneous networks look as homogeneous as possible — a shield from the complexities of open systems, and a common metaphor across diverse platforms.

Unispool, from API International (Austin, Texas), helps to integrate MPE/V, MPE/XL, MPE/iX, HP-UX, Apollo DOMAIN, IBM AIX, DEC ULTRIX, OSF/1 and VMS, Sun Solaris 2, Seimans and SCO UNIX. Unispool permits bi-directional printing between hosts and Microsoft LAN Manager OS/2, Windows NT or Novell

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could dump all  
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set up a new  
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## Magic

LANs. Spoolfile Management is the main module of Unispool. It automatically re-routes jobs if the original printer fails. Single-seat, enterprise-wide control gives administrators access to all printers. The control client can be run off a low-cost Windows PC instead of a workstation. The latest version includes an NLM to link Novell servers.

### THE MISSING LINK

**FLEXIBILITY AND control.** In themselves, they're keys to network printing success. But there's one other aspect that can't be forgotten, and that's transparency, which yields connectivity products — those that help break down the barriers between heterogeneous platforms.

Puzzle Systems (Morgan Hill, Calif.) markets two connectivity products that have beneficial network printing side effects. The first is Softnet Utilities, which allows UNIX platforms to

**The  
Gartner Group says that  
79 percent of organizations plan  
to implement client-server  
networks.**

emulate a Novell 312 server. This means bi-directional UNIX/Novell printer sharing and terminal emulation, all accomplished using IPX only. Jim Leslie, director of marketing, outlines the strategy. "You do nothing to the Novell network; just leave it alone. You take the software only on the HP side. You do not reconfigure the kernel, and you don't partition the disks. The HP now has the ability to see and understand IPX." Softnet Utilities competes against Portable NetWare.

The second Puzzle product is Softnet NFS. It runs only on the Novell Server 3.1x or 4.x as an NLM. The Novell server can then function as an NFS server. It's an alternative to Novell's NetWare NFS. Bi-directional printing is included in the package. According to Leslie, the task is to allow file and printer sharing without forcing the users to use anything other than their standard, native commands. That means no hybrid commands — in other words, transparency. "It's less of

*You could shop  
around endlessly  
to solve all your  
networking  
and output  
management  
needs.*



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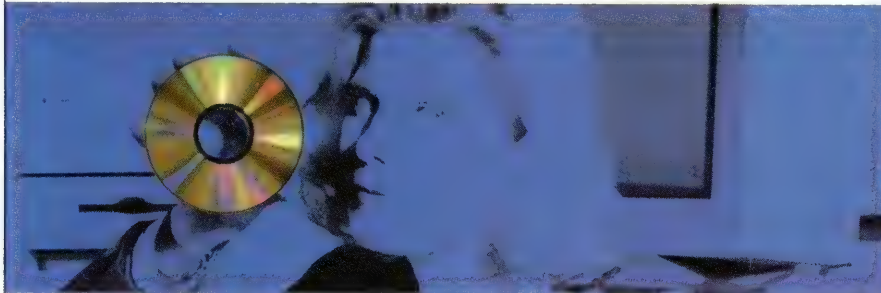
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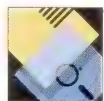
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## Magic

an 'US and THEM' environment," says Leslie, when it comes to UNIX and Novell users.

For HP 3000 users, NP92 from MiniSoft Inc. (Snohomish, Wash.) allows the printing of HP spoolfiles to any printer configured for TCP/IP or LANs through NetWare, NT, Banyan Vines or the LPD protocol. NP92 sits as a background task on the HP 3000 and spools output to print destinations over the network. There is support for carriage control conversion, HP environment files and banners.

Both HP 3000 and HP 9000 users also may want to check into NBSpool from Quest Software (Newport Beach, Calif.). It allows you to take spoolfiles and view, move, copy, store and purge them. Manipulation can be performed on single files, all files or groups of files.

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THE FINAL REALITY is that with factors such as changing landscapes, acquisitions and downsizing no one can really predict what their printing needs will be in the future. So it's important to remain flexible and expect the unexpected.

With an open strategy based on connectivity and expandability, network printing will be as easy as abracadabra. — *Jim Esch is a freelance writer specializing in high technology, based in St. Louis, Missouri. He can be reached at [jmesch@artsci.wustl.edu](mailto:jmesch@artsci.wustl.edu).*

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# The TEN Commandments

*This month Fred Mallett continues to share his experiences while working with HP-UX 10.0. Part I (published in March 1995) focused on the general differences between HP-UX 9.x, and HP-UX 10.0. This month, Part II concentrates on new and different commands, as well as the new SVR4 file system layout. Part III, the last installment, to be published this November, will summarize the various features in HP's first major OS release in three years.*

## Don't Let A New File System Plague You When Using HP-UX 10

### So where were we? Changes.

The changes to the file system layout are among the most readily noticeable:

```
hpux10$ ls /system
/system not found
```

Luckily, they also are the easiest to learn. Just retrain your fingers to type in the new SVR4 based pathnames. Use **man 5 hier** to locate things. Then, you can thank HP for putting in symbolic links for those times you're cursing and trying to remember the new pathnames.

This disk organization is commonly called the AT&T SVR4 File System (also known as V.4, V4FS and the OSF/1 File System). V4FS is commonly accepted as the de facto industry standard for organizing files in directories under UNIX.

This is not an internal disk data structure change. However, keep in mind that all vendors (including HP) add their own little twists to V4FS. HP calls it "HP-UX

10.0 File System Layout" or "HPFS."

For the most part, however, you can now move between V4FS compliant vendors without getting too many "directory not found" errors. So, what are the benefits of moving to the SVR4 format?

To provide a hierarchy that allows specific directories to contain files organized by their "shareability." Directories containing files can be shared with binary compatible hosts, and others for dissimilar machine types. There also are directories that contain files that can be edited by this host upon boot. And for configuration purposes, those files are not to be shared at all. If you're thinking "this must provide support for the NFS method of diskless booting," you're right.

Built into these changes are new startup file methods and configuration scripts. The new startup model is necessary for supporting the new NFS-based diskless model that HP-UX 10

**Fred Mallett**



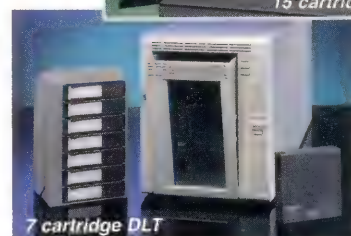
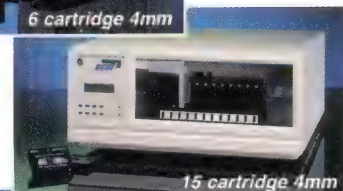


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uses. Each script leaves messages as it boots, so you get a better granularity of progress than in HP-UX 9.x. Unfortunately, a shutdown takes substantially longer than it did in the past. (For more detailed descriptions of the startup files in HP-UX 10.0, see the UNIX SYS\_ADMIN column in the April 1995 issue of *HP Professional*).

Files are grouped into the following directories: static vs. dynamic, executable vs. data, sharable vs. private, application vs. operating system, temporary datafiles vs. permanent datafiles, fixed in size vs. expandable and user vs. system.

If you look at the list below, the beauty of this layout should become apparent. It's now easier to protect OS data and executables. It's also easier to manage disk space and logical volumes when you can tell which directories might grow larger and which you will not.

Directories you will ever need to edit files in (and backup) are more restricted now. Client-server software is easier to organize, and diskless NFS is easily configured (or as easy as diskless NFS can get).

Next, let's discuss the new file layout (see diagram) as well as the kind of files found in each group. Please note that while this is not a complete listing, the primary groups are covered.

The upper level directories are broken into two groups: static (shared) and dynamic (private). This may seem odd at first glance, but the contents of

these directories also have changed. The /etc directory now only contains data. There are no binaries in there. But there are plenty of links to binaries. So don't feel dumb when you type:

**/etc/if-config:**

```
hpux10$ ls -l /etc | grep -c "^l" 167
```

All the binaries from /etc are now located in other directories like /usr/sbin (for those needed to boot the system), and /usr/lib/netsvc (for network tools like yperv, ypbind, rwall and rstat). Data files like termcap have been moved to /usr/share/lib.

Below are descriptions of some of the root level and subdirectories with the contents of each.

Dynamic Directories:

**/etc**

Host-specific configuration files and databases. Note that things like `vue sam mail` and `lp` now have their configuration files under here (/etc/vue??? yes!!).

**/etc/opt**

Application-specific configuration files for optionally loaded or purchased products like `audi dce sharedprint`.

**/var**

Subtree root files that change dynamically. Types of files found under directories in var include log files, temporary files and spool files. This is where the mail files, lp spooler, cron files and news went to. There are many subdirectories under here, including:

`adm, mail, ncs, news, opt, ppl, preserve, rbootd, run, sam, spool, statmon, tmp, uucp, vue` and `yp`. A new one of note is `/var/spool/sw` which is the default location for a software distribution depot, the near equivalent of an HP-UX 9.x netdist.

**/dev**

Still has the device files, but the name conventions have been standardized in HP 9000 Series 700s and 800s.

**/stand**

Has the binaries and configuration files for building a kernel. It also contains the kernel itself, the default now called `/stand/vmunix`. The name comes from standalone. Also under the dynamic directories is the `/tmp` and `/tmp_mnt` directories.

Static (thus sharable) directories:

**/sbin**

Commands needed to boot the system and mount file systems. There are lots of surprising commands here, like `date` and `cat`, but they are needed by the startup scripts (some of which live here). The full set of commands live in `/usr/bin`, and are not available until after the `/usr` directory/disk is mounted. Note that `/bin` does not exist, except as a symbolic link to `/usr/bin`.

**/usr**

Entry point for a subtree of sharable commands, libraries and optional products. Mostly binaries, some databases. No system specific data here. Can be some site-modified databases, such as `/usr/contrib` and `/usr/local`. Note that the `/usr/ccs` directory is where the C compiler programs now live. `/usr/ccs/bin` has `make, cc, yacc, strings, strip` and others.

When browsing this directory remember that these directories and files are considered static. There are other similarly named directories under `/var` for making configuration changes. Here is a sample list of subdirectories to `/usr`: `adm, bin, bms, ccs, conf, contrib, etc, examples, include, lbin, lib, local, mail, man, newconfig, news, obam, old, preserve, pub, sam, sbin, share, spool, tmp, tsm` and `vue`.

Some subdirectories worth noting here are:

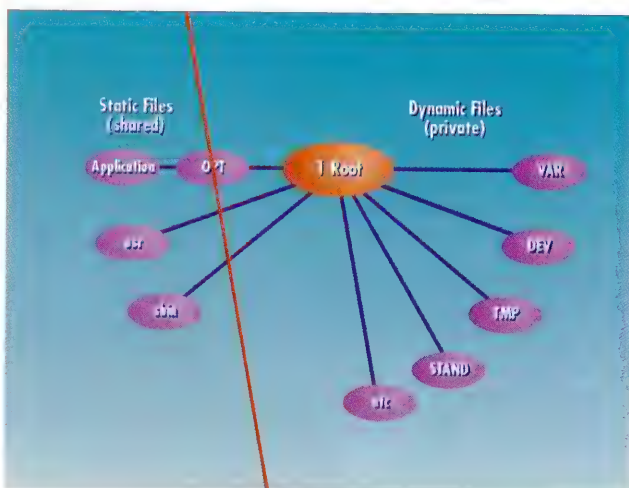
**/usr/lbin**

This is for backend executables to other commands. A backend executable is not usually invoked by a user, instead it is called by another `/usr/bin` command. An example would be `execrecover` which is called by `vi -r`.

**/usr/newconfig**

New versions of customizable configuration files and databases are

## Static vs. Dynamic File Layout





shipped here so as not to overwrite currently configured versions. These are the files you need to copy after an update. It used to be /etc/newconfig.

/usr/old

For files and programs that are being phased out or are obsolete.

/usr/sbin

System administration commands.

/usr/share

Architecture-independent sharable files.

/opt

Root of subtree for optional application packages. This organizes all applications nicely. No applications should be loaded under /usr or in /anywhere. /opt could be considered a dynamic directory, because the subdirectories (applications) it has in it are host-dependent, but the subtrees in it are commonly mounted across the network and shared. If you don't like it called static, get out a crayon and change the picture ;^)

That's about it for the five-minute tour of the new file system layout. I'll admit that the transition links have helped me out a great deal, and that I have done some searching for files. But overall, the new file system layout is not too tough to get used to.

Just remember **man 5 hier**.

## UPDATE ON /ETC/UPDATE

THE OLD /etc/update SW install tool is gone. The Software Distribution utility (SD-UX), which replaces it, has been hanging around for years. I think I first saw the predecessor to this tool around 1992 when it was being offered to the OSF as a technology. Now, SD-UX bundled with the OS (not a purchased upgrade), finally gets to come out of the labs.

SD-UX also has been sold as the HP OpenView Software Distributor (a slightly different version). This tool has the usual ability to run in both character and graphics mode, so you can run it during boot and under X Windows. Or you also can specify everything on the command line. The interface is slightly different, but takes no real studying to figure out. There is context-dependent help.

Lets talk about the new capabilities and changes from DUI, the HP-UX 9.x tool. **swinstall**, which lives in /usr/sbin, is what you now need to execute. It is used for both initial installation and updates, as well as adding products. **swinstall** replaces **update** and **install**.

**swremove** replaces **rmfn**. The old customize scripts, for loading or removing a fileset, are now called control scripts. **swconfig** runs these control scripts. For those of you that

used **swinstall** to create filesets to install with update the tool is **swpackage**.

**netdistd** which allowed you to load from a disk based source (called a netdist area), across the network has been replaced by **swagentd** as the server program to allow this type of loading from a "software depot."

New features:

Some of the features that we have been asking for are included with SD. Like the ability to do a pull installation across the network, and that non-root users can be allowed to install software.

There now is a **swverify** tool to check out an installed product. You can also use **swacl** to view and change permissions on software products. A new concept to SD is that of "bundles."

Filesets make up a product (or subproduct). A bundle is a set of one or more products. This makes loading a configuration to a host much easier. And I'm told the HP product bundle names will actually match the names on the corporate price list. — Fred Mallett is owner of FAME Computer Education, which provides UNIX usage, administration and programming classes, and HP Professional's UNIX SYS\_ADMIN columnist. He can be reached at frederm@aol.com.

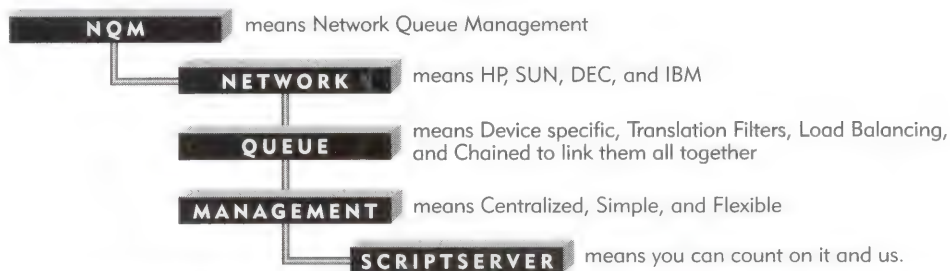
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Jill Huntington-Lee

## What To Do About OpenView?

**You may recall my April column where I vented my frustration with HP's delay in delivering true**

multiuser, distributed management in their Network Node Manager (NNM) product. I also questioned HP's strategy of steering customers to their OperationsCenter and AdminCenter products instead of spending more time and effort on fixing NNM's deficiencies.

So this article is for those OpenView customers who applauded my last column, but now want to know what their options are.

### **1. Stand Fast.**

Don't change a thing, and try to hold out until the day when HP delivers distributed management based on the Object Management Group's (OMG) Common Object Request Broker Architecture (CORBA).

To be honest, there's an element of risk involved here. The OMG recently decided that *portability is more important than interoperability*. That's fine if you've got a bunch of unconnected systems, but it's a real problem if you want to manage a network. In other words, the OMG has hit a stumbling block. And if HP continues to bide their time until the OMG comes to an agreement, the wait could be long indeed.

Unfortunately, the OMG's CORBA is the best hope for delivering an open, ubiquitous standard for distributed, object-oriented management. Yet, several vendors — like DEC, for example — already have object request brokers (ORBs) that support interoperability between most major UNIX platforms.

### **2. Switch Platforms.**

Comparable products from Sun, IBM and Cabletron already support distributed management *today*. Solutions from DEC and AT&T also have features that NNM lacks (but that's a future column).

Most organizations, however, are unwilling to go to this extreme, which is understandable. Infrastructure changes are not only difficult but can be embarrassing for the person who makes that purchase decision. And besides, the competition has problems too. For example, IBM's SystemView Series supports distributed management via SNMP-based smart agents; but it still can be difficult to leverage these capabilities effectively unless you're an SNMP guru.

Sun Solstice Enterprise Manager uses Common Management Information Protocol (CMIP), which supports the OSI stack rather than TCP/IP. But we all know that CMIP gurus are incredibly hard to find.

Cabletron's (Rochester, N.H.) Spectrum, on the other hand, does something entirely different — it sup-



# The OMG's CORBA is the best hope for delivering an open, ubiquitous standard for distributed, object-oriented management.

ports multiple distributed servers as well as clients. Spectrum is relatively easy to use, but the object technology is all Cabletron's anyway (i.e., not an open standard). It doesn't seem to bother many Spectrum users. However, if you're hooked on standards, it shouldn't be your first choice.

### 3. Do It Yourself

By using third-party product add-ons like NetLab's NerveCenter (recently acquired by Seagate Technology of Scotts Valley, Calif.) or smart agents from vendors like Legent Corp. (Computer Associates announced its intention to acquire Legent in May), it is possible to extend NNM to manage at least a few more hundred nodes.

While this is an attractive (and successful) alternative for some organizations, it takes expertise to integrate those tools effectively. With smart agents, the idea is to distribute polling across the enterprise. Otherwise, you need to use

one centralized copy of NNM to poll all network devices for status.

Usually, the agents reside on workstations scattered throughout the network. Each agent then polls devices nearby, comparing the results to user-defined thresholds, and forwarding only the most critical alarms to the central NNM. This approach works well, as long as you've figured out how to optimally configure your agents.

By allowing a network administrator to configure NNM polls more intelligently using conditional state diagrams, NetLabs NerveCenter, which costs about \$15,000, achieves scalability in a different way. For example, instead of just telling NNM to poll a critical router every minute and create an alarm if the router goes down, NerveCenter can be configured to wait a few seconds after it discovers that the router went down, try polling again and send an alarm only if the

second (or third) poll fails as well.

When polling critical servers, NerveCenter can suppress an alarm that was triggered because a server was unreachable, if it also detects that the router attached to that server is having problems. If you know your network and understand SNMP, you can dream up some creative algorithms that minimize the number of alarms NNM must deal with during times of network failure.

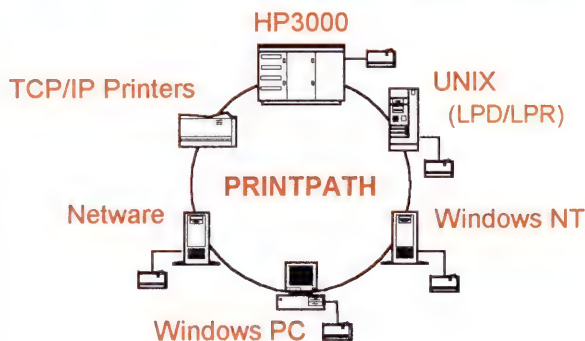
Six months ago, NerveCenter was not an attractive option for many NNM users. Because it performed functions that were duplicated by NNM, unnecessary overhead in network traffic and storage requirements would have been incurred. But since the last release of NerveCenter, much of that duplication has been eliminated. And according to early reports — the results are positive.

In fact, one customer I've talked with is using the NNM/NerveCenter combination to manage over 1,000 nodes at 30 remote sites. And if HP delivers distributed management capabilities next year, he may not upgrade right away because he has already decided his current configuration works quite well, thank you.

*Huntington-Lee's Internet address:  
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### Chevy Provides InterBackup V1.5

Chevy announced InterBackup version 1.5, a new generation approach to managing enterprise-wide backups and restores for UNIX-oriented client-server networks.

InterBackup version 1.5 features include an object-oriented approach to defining and scheduling multiple simultaneous backups over a distributed network to multidrive tape libraries. InterBackup's multidrive stacker support allows the software to independently arbitrate simultaneously scheduled backup orders or "objects" to available drives, providing maximum use of the stackers and libraries.

The use of "classes" enables users to "own" tapes in the libraries that can be automatically assigned to that user's backup requests, and autoloaded by the library's robotics, transparently controlled by InterBackup version 1.5. Enhanced search and restore tools allow the user to navigate through time in the comprehensive database using a virtual file system, allowing the user to restore the most recent backup to any directory on the network.

Users don't have to know UNIX commands to perform backups and

restores. InterBackup V1.5 runs as a server on: SunOS, Solaris, HP-UX, IBM AIX and SCO UNIX.

Contact Chevy, 4764 Park Granada, Unit 202, Calabassas, CA 91302; (818) 225-6060.

*Circle 396 on reader card*

### Island Software Corp. Introduces IslandCalc V3.0

Island Software Corp. announced the availability of IslandCalc 2.0, the latest version of Island's graphical spreadsheet for UNIX workstations. IslandCalc offers multiple sheets within worksheets, intelligent cell copy, data drag and drop, split view worksheets, 3D graphics and full support for Lotus 1-2-3 file formats and macros.

IslandCalc 3.0 includes over 99 functions including arithmetic, trigonometry, logical, statistical, database, business, date and time.

IslandCalc 3.0 is available for SPARCstations running SunOS 4.1.3 or Solaris 2.3, HP 9000 Series 700 and 800 workstations running HP-UX 9.0, and IBM RS/6000 workstations running AIX 3.2.5. Price is \$495.

Contact Island Software Corp., 90 Digital Dr., Novato, CA 94949; (415) 884-4400.

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# When Your Data's Under Siege, You're Protected.

In the battle for the desktop, don't leave your data unguarded.

The explosion of user data has created a backup task of enormous magnitude. You need a client/server solution designed for the complexities of today's distributed computing environments. You need **NetWorker for HP 9000**.

NetWorker efficiently and effectively counters all threats to your data. Backup and recovery of the entire organization is centralized on the HP 9000 server. The storage management requirements of an entire multi-vendor network can be met using this integrated, enterprise-wide solution.

More Unix desktops and servers are protected by NetWorker software than by any other solution. Combine that with NetWorker's proven protection for NetWare, OS/2, DOS/Windows, and Windows NT, and the battle to defend your data is won.

NetWorker's legendary protection. Available for HP-UX from Innovus.

For more information on NetWorker for HP 9000, contact an authorized reseller, or INNOVUS at:

(905) 529-8117, Fax: (905) 572-9586,  
or E-Mail:

URL: <http://www.innovus.com>



Legato NetWorker is a registered trademark of Legato Systems, Inc. All other trademarks are the property of their respective owners.

## INNOVUS Technologies Inc.



CIRCLE 167 ON READER CARD



## ISSI Announces Safari Reportwriter

Interactive Software Systems Inc. (ISSI) introduced Safari Reportwriter, which combines presentation-quality reporting capabilities with the security of their three-tier information access and delivery architecture.

Safari Reportwriter resides on the desktop. It uses data delivered by ISSI's server-based central data dictionary and engine to generate boardroom-quality reports from operational and decision support data.

ISSI's server allows Safari end users to access data from multiple data sources and platforms while meeting the security and efficiency requirements of the entire enterprise.

Safari's layout features include a full range of formatting capabilities. Graphical, pixel-oriented layout capabilities, full-color support, drawing tools and embedded bitmaps are all supported.

Data from desktop or server applications with ODBC interfaces also can be accessed with Safari. The report writer also functions as an OLE 2.0 container, allowing embedded documents to be linked back to their original applications.

ISSI's server is supported on HP-UX, MPE/iX, IBM AIX, SCO Open Desktop, Sun Solaris II and DEC VAX, Alpha AXP and Digital UNIX.

Contact ISSI, 7175 W. Jefferson Ave., Denver, CO 80235; (303) 987-1001.

*Circle 393 on reader card*

## Software Professionals Offers ENlighten

Software Professionals Inc. announced the availability of the ENlighten Open Systems product line, a fully integrated suite of automated system administration software.

ENlighten supports IBM AIX, HP-UX, SunOS and Solaris, and SCO UNIX. It is designed using open standards-based protocols, for the management of systems, users, disks, backup/restores, security, processes and printer functions distributed throughout a heterogeneous UNIX network.

The ENlighten/Sys Admin Package includes a range of monitoring and administration features that run under the ENlighten/UI (User Interface), a standardized GUI that spans multiple UNIX platforms. The Sys Admin Package contains the following integrated modules: /User, /Disk, /Archive, /Security, /Printer, /System and /Watchdog.

The ENlighten/Events software module monitors devices, processes and multiple heterogeneous UNIX systems. It automatically collects and saves status, configuration, performance and capacity information. This information can be viewed by most commercial network management products such as SunNet Manager, HP OpenView and IBM NetView.

The ENlighten product suite is offered in packages of five, 10, 25 and 50 managed

nodes. The Sys Admin Package, which includes seven applications, costs \$360 per each managed node in quantities of 50. The /Events module, sold separately, starts at \$175 per managed node in quantities of 50. Contact Software Professionals, 999 Baker Way, Fifth Fl., San Mateo, CA 94404; (415) 578-0700.

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CIRCLE 472 ON READER CARD



## Reasoning Systems Introduces Refine/Cobol

Reasoning Systems announced the release of Refine/Cobol, the customizable re-engineering workbench for programs written in COBOL on UNIX workstations from Sun, IBM and HP. Refine/Cobol is a graphical workbench for maintaining, improving and re-engineering existing COBOL systems.

The graphical workbench lets you

understand code structure, analyze the impact of changes, generate documentation, re-engineer, assess and improve code quality, and export design information to CASE tools such as Teamwork from Cadre Technologies.

Refine/Cobol comes with a fully documented re-engineering API, so user can add customized re-engineering capabilities.

Contact Reasoning Systems, 3260 Hillview

Ave., Palo Alto, CA 94304; (415) 494-6201.

*Circle 390 on reader card*

## Setpoint Inc. Releases Desk

Setpoint Inc. released Desk layered software module, an ad hoc tool for SQL access at the desktop. For users of Setpoint's InfoPlus-X and Setcim real-time information systems, this product provides an easy-to-use tool for obtaining reports and analyses of current and historical process data in InfoPlus-X and Setcim, as well as any integrated relational databases.

Desk creates a middleware bridge between the PC or workstation application and SQLplus, an ANSI SQL-based query module for the InfoPlus-X and Setcim real-time database systems.

Desk operates with a variety of applications on Microsoft Windows, Mac, OS/2, UNIX and VMS platforms. InfoPlus-X and Setcim support DEC VMS and OpenVMS, IBM AIX and HP-UX platforms.

Contact Setpoint Inc., 14701 St. Mary's Ln., Houston, TX 77079; (713) 584-1000.

*Circle 389 on reader card*

## Tryonics Expands Asset Management

Tryonics announced two new programs in the expansion of its Asset Management Services. It's Gold Tryangle Program manages all aspects of customer product returns including off-lease, upgrades and trade-in equipment. The Green Tryangle Program renews, remarkets and recycles customer surplus and retired computer equipment. Tryonics offers its customers complete services including site pickup, inventory, tracking, refurbishment, remarketing and customer reporting.

Contact Tryonics Inc., Ste. 15, 170 West Rd., Portsmouth, NH 03801; (603) 427-6850.

*Circle 387 on reader card*

## WRQ Reflection Series Adds Features

WRQ announced Version 5.0 of its Reflection Network Series, which provides seamless access from your PC to enterprise-wide information via networked, mobile/wireless or Internet communications in one package.

Version 5.0 includes a Windows NFS client with OLE support, so users can share documents across network drives as easily as on their own desktop.

Reflection NFS lets users connect to an unlimited number of remote volumes, print



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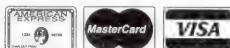
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### NEW \$1,000 2 GB SCSI-2 SUB-SYSTEM FOR HP-UX SYSTEMS

To introduce the new 9000 Series of Floppies, Hard Disks and Tape Storage Products for HP-UX Systems, Texas ISA is offering a special introductory pricing on their new **high performance 2 GB** subsystem. It's **fast** with an average seek time of **9.5 ms**. More importantly, it's extremely **reliable** with an MTBF of 800,000 hours. That's why it's backed with a **five-year warranty**. But best of all, its compatibility with your HP 9000 Series 700/800 systems is **guaranteed**! Contact Texas ISA at (800) 361-2258, or (713) 493-9925.

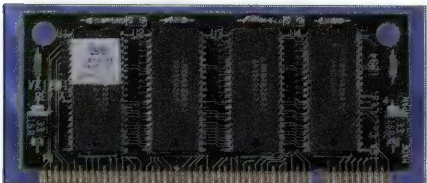
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### INTRODUCTORY PRICING FOR HP712 MEMORY BOARDS

ISA introduces their newly released memory cards for the HP712 with a special introductory pricing. Call for their 32 MB and 64 MB guaranteed best prices, with lifetime warranty. Call (800) 361-2258 or (713) 493-9925.

Circle 401 On Reader Card



### AUTOMATIC UNIX STARTUP/SHUTDOWN DEVICE PROVIDES SECURITY, SAVINGS AND CONVENIENCE

Texas ISA, Inc. announced the availability of its new Model 7030 with an Ethernet interface to allow the operation and control of networked UNIX system(s), with a single flick of a switch. The system power ON/OFF process can also be automated by the built-in timer, UPS Power Fail Signal, a shutdown request from the RS-232 or modem ports, and also by environmental triggers such as temperature and humidity. Additionally, alarms or preset messages can be sent to a pager. A Model 7020 (with no Ethernet interface) is also available. Prices for the Models 7020 and 7030 range from just under \$1,000 to \$2,500. Contact Texas ISA at (800) 361-2258, or (713) 493-9925.

Circle 402 On Reader Card



### NEW TOTOKU HIGH RESOLUTION, FULL-FEATURED COLOR MONITORS

If you are looking for a high-quality 17- or 21-inch color monitor, check out the new Totoku line of enticingly priced monitors from Texas ISA. Totoku has been an OEM for Sony and other vendors, and now introduces their very own models, the CV172U (17-inch priced at \$1,190) and CV211U (21-inch priced at



\$2,125). Texas ISA can be contacted at (800) 361-2258, or (713) 493-9925.

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CIRCLE 245 ON READER CARD



to remote devices and perform NFS management operations. A graphical NFS Administrator allows IS managers to view and change file permissions, configure local/global NFS parameters and quickly obtain information about the file systems, printers and host-based remote services.

Other new features include client support for DHCP (dynamic host configuration protocol) and NetBIOS. Also added is NFS data caching and ftp directory caching. Version 5.0 supports on-demand

dialing for all of the leading CDPD modems. It also includes a set of courtesy Internet applications, including Enhanced Mosaic and the WinVN newsreader.

Price starts at \$249 for a single user copy.

Contact WRQ, 1500 Dexter Ave. N., Seattle, WA 98109; (800) 872-2829.

*Circle 385 on reader card*

## **HARDWARE**

### **Intelligent Interfaces Offers HP-IB Converter**

Intelligent Interfaces announced the MicroPrint 45CV HP-IB (IEEE-488) to Centronics converter, which converts HP Centronics printers, HP computers and ATE with HP-IB interfaces. The unit is totally transparent to the application or ATE software, and requires no software changes or additions.

MicroPrint eliminates common test and measurement equipment output problems: illegibly small or too large, off-the-page graphics when using the HP-IB test equipment with HP Centronics printers. HP printers default to their lowest or highest resolution on power up. The MicroPrint Variable Resolution mode allows convenient switch selection of resolutions and graphics output size.

HP-GL mode allows inexpensive HP LaserJets to be used in place of expensive plotters. ThinkJet, PaintJet, QuietJet and DeskJet printers are supported for portrait orientation raster (bit mapped) graphics. LaserJet printers are supported for portrait and landscape raster graphics. Additionally, HP-GL mode allows LaserJet Series 3, 4 and 5 to be configured as plotters in landscape and portrait orientations.

The MicroPrint 45CV is priced at \$299, and includes a 10-foot Centronics parallel cable.

Contact Intelligent Interfaces Inc., P.O. Box 1486, Stone Mountain, GA 30086; (800) 841-0888.

*Circle 384 on reader card*

### **Elektroson Ships Gear and Gear MM**

Elektroson shipped Gear and Gear MM (multimedia and multiformat) versions of its Gear software for six UNIX platforms. New features on Gear 3.2 for UNIX include full Rock Ridge extension and mapping support; drivers for Kodak PCD-6000, Kodak Disc Transporter; and the Pioneer DRM-5004X CD-R jukebox for data storage applications.

Gear 3.2 for Sun is available on SunOS 4.1.3 and Solaris 2.3 and 2.4 operating systems. Gear 3.2 for HP is available on the HP 9000 Series 700 and 800 workstations running HP-UX 9.x. Gear 3.2 for SGI will run on Irix 5.2 and 5.3. Gear 3.2 for DEC OSF will run on Alpha processors and will be available for OSF 1.3 and 3.0. Gear 3.2 for IBM AIX and NEC EWS will run on all IBM RS/6000 and NEC EWS machines and will support the

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# Reader Information

## **ARTECON INC. CIRCLE 242**

Artecon is a leading systems integrator and manufacturer of value-added hardware and software products for the UNIX marketplace. Product lines include Opticals, Removables, Backups, Storage and Accessories. Call (800) USA-ARTE, FAX (619) 931-5527.

## **COMPUTER MARKETING INTERNATIONAL INC. CIRCLE 454**

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## **CONCORDE TECHNOLOGIES CIRCLE 232**

Concorde Technologies, Inc., "The Hewlett-Packard Experts" is an HP Channel Partner and Value Added Reseller of HP and third party products for the HP 9000. Concorde's line of products includes HP 9000 systems, application software, CD-ROM solutions, RAM memory, mass storage peripherals, and accessories. For the best prices, availability, warranty and support call Concorde Technologies at (800) 359-0282.

## **DATASTRUCTURE, INC. CIRCLE 231**

Datastructure's DB/Access provides online data warehousing and offline archiving for the HP 3000 with no scripting or programming. The powerful screen interface offers unlimited field value selection, accessing multiple input and output files. Multiple database and file targets are built automatically. DB/Access selectively extracts, transfers, deletes, and restores data between Image KSAM and flatfiles.

With unlimited value selection, DB/Access generates meaningful test data; capacities are set at the console. Omnidex and Superdex integration provide fast data retrieval. Comma delimited files can be used for PC downloading.

Call (415) 495-7484.

## **IEM CO. CIRCLE 122**

IEM offers affordable solutions for the HP environment, including 4mm and 8mm tape drives, autoteaders and carousels, QIC tape drives, optical drives (WORM, Multifunc-

tion and CD-ROM), fixed winchester drives, floppy disk drives and combination drives. IEM's new Building Block product line is a modular storage solution into which you can slide a number of different disk, tape and optical units for unlimited storage configurations. IEM also offers an automated backup and archival software solution. Most IEM products are available with an HP-IB or SCSI interface for HP 1000, 3000 and 9000 computers. Call (970) 221-3005 or (800) 321-4671, or send E-mail to [info@iem.com](mailto:info@iem.com).

## **KINGSTON TECHNOLOGY CORP. CIRCLE 281**

Kingston Technology designs and manufactures memory upgrades for PCs, laptops, workstations and laser printers. The Kingston product line also features mass storage subsystems and processor upgrades. Call (800) 835-2545, FAX (714) 435-2699.

## **M.B. FOSTER ASSOCIATES LTD. CIRCLE 155**

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## **NEWPORT DIGITAL CORP. CIRCLE 246**

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## **OMTOOL CIRCLE 130**

Omtol's Fax Sr. is the versatile network fax software based on client-server architecture. Clients are available for Windows, DOS, Macintosh, Windows NT and Motif with server options including Windows NT and HP-UX.

Call (603) 898-8900.

## **PUZZLE SYSTEMS CIRCLE 158**

SoftNet Utilities is a NetWare server emulator for UNIX platforms providing IPX-based services without inhibiting existing TCP/IP or other capabilities, DOS terminal emulation and bi-directional UNIX/Novell printer sharing. SoftNet NFS brings file service capabilities to PC-based Novell servers. NFS enables the Novell server to be mounted and accessed as a standard file server on any Novell network. Call 408-779-9909.

## **QUEST SOFTWARE CIRCLE 268**

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Call (800) 361-2258 or (713) 493-9925.

## **UNISON SOFTWARE INC. CIRCLE 499**

Unison-Tymblabs is a supplier of networked systems management solutions for both UNIX and MPE. Product areas include workload management, storage management, print automation and desktop integration.

Call (408) 245-3000.

## **WRQ (WALKER RICHER & QUINN) CIRCLE 263**

Makers of Reflection Series Software. HP terminal emulation for PCs and Macintoshes. Call (800) 872-2829.

## **WESTERN SCIENTIFIC MARKETING INC. CIRCLE 480**

Western Scientific offers a line of high-performance peripherals to upgrade and enhance your Sun, HP, Silicon Graphics, DEC, IBM RS/6000 and Novell workstations. We configure, integrate and test innovative disk, tape optical, RAID, jukebox and memory subsystems to meet your application requirements. Call (800) 443-6699.

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latest version of their respective operating systems.

Gear for UNIX offers complete multi-media support, including mastering support for Digital Audio, CD Enhanced, CD-I and VideoCD authored files and MPEG; as well as 3DO, Nintendo and other game platforms. It also offers support for XA Interleaving and XA formats, such as Sony EB, XA Bridge and MMCD.

All Gear software, which is also available in Mac and Windows versions, support 1x, 2x, 4x and 6x writing from virtual and physical modes. It also offers advanced proprietary image mastering options, subcode support and DDP format mastering tape.

Gear 3.2 for UNIX costs \$1,695. The MM version costs \$2,695.

Contact Elektroson USA, 10 Presidential Blvd., Ste. 125, Bala Cynwyd, PA 19004; (610) 617-0850.

*Circle 383 on reader card*

## Applied Concepts Releases PowerSwitch

Applied Concepts announced PowerSwitch, a low-cost dual server fault tolerant solution for networks.

To install, simply plug in two or more servers into the Applied Concepts PowerSwitch, add the external storage devices and power up the system. In the event of a primary server failure, or if a server has to be taken down for maintenance, users switch to the back-up server and realize virtually zero down time.

When used with IBM's NetFinity network manager, user can program their configurations to switch to the backup server automatically and notify the network administrators of the main server failure.

Platforms installed with the PowerSwitch include IBM, HP, Sun and Compaq. Novell NetWare 3.x and 4.x, IBM OS/2, SCO UNIX and Windows NT are current installed operating systems. PowerSwitch is available in configurations starting at \$1,995, which includes electronic switching hardware, installation cables and IBM's NetFinity.

Contact Applied Concepts Inc., 9130 SW Pioneer Ct., Wilsonville, OR 97070; (503) 685-9300.

*Circle 382 on reader card*

## Super SEU Supports HP 9000 Series 700s

SBE Inc. announced support for the HP 9000 Series 700 workstations by introducing the Super SEU family of EISA asynchronous serial expansion units. The Super SEU-8 and Super SEU+ provide from eight to 64 ports of asynchronous serial communications for the HP workstations. Both controllers support data rates up to 230 Kbps (115 Kbps full duplex) to accommodate the V.34 standard with 4:1 compression.

The Super SEU-8 features eight ports of asynchronous serial communications. Port connections are established via EIA-232 (DB-25) fan-out cables attached to a DB78 connector on the card edge.

The Super SEU+ is an expandable system of asynchronous I/O that allows HP users to add from 16 to 64 ports with a single EISA card. A cable attaches the EISA board to a 16-port DB-25 expansion module. Additional modules are attached to each other. The expansion module can be set on any flat surface or wall-mounted to save space.

The Super SEU family of boards include HP-UX drives and full installation software.

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Surge protection and full modem control are featured on all ports. The Super SEU-8 and Super SEU+ cost \$995 and \$1,865, respectively.

Contact SBE Inc., 4550 Norris Canyon Rd., San Ramon, CA 94583; (510) 355-7635.

## Tektronix Enhances Multimedia Desktops

Tektronix introduced the next generation of high-performance integrated multimedia desktops for the commercial enterprise market. The TekXpress XP400 series X terminals deliver a combination of rapid display manipulation and high-quality digital audio/video capabilities.

The XP400 employs an optional MPEG audio/video co-processor and is capable of displaying multiple high-performance X windows and simultaneously, broadcast-quality video and audio. In addition, the XP400's wide 32-bit I/O architecture is designed to support emerging standards including ATM and 100 Mbps Ethernet.

With Tek XpressWare, an X Window-based information software, the XP400 series can access network mainframe, legacy and UNIX applications.

Standard features include a high performance LSI 33120 RISC processor; 8 MB of RAM (expandable to 136 MB); 2 MB of VRAM; twisted pair Ethernet interface; two RS-232C ports; display; integrated power supply; power cord; and mouse. Options include an advanced MPEG digital video co-processor, audio co-processor, thinnet and thicknet interface, externally accessed dual-slot PCMCIA interface, flash memory, parallel port, keyboard (as an F-kit) and Sony 20-inch monitor (for the XP419C). A Token ring PCMCIA adapter card also is optional.

The four models — XP400, XP417C, XP419C and XP421CH — range in price from \$2,695 to \$4,795.

Contact Tektronix, P.O. Box 1000, Wilsonville, OR 97070; (503) 685-2838.

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## Lightwave Distributes SystemConsoleSwitch

Lightwave Communications Inc. introduced SystemConsoleSwitch, a controller that allows a single RS-232 terminal to monitor and control an entire data center. The SystemConsoleSwitch connects a terminal to as many as 96 different computers, LAN bridges and routers, and workstations. It attaches to the equipment console port and allows network or data center managers to monitor and

control the attached devices and to observe equipment operation. The SystemConsoleSwitch stores multiple pages of buffer memory for each attached device. Information stored in this memory can be scrolled through to observe activity or diagnose problems with equipment operation. An attached printer can be used to obtain a hard copy of any screen and an external modem can be used to remotely access the SystemConsoleSwitch.

Each SystemConsoleSwitch chassis can

attach up to 12 devices by adding up to six dual-port modules. Dual-port modules can be added at any time to accommodate customer needs.

The SystemConsoleSwitch chassis containing the control circuitry and slots for six dual-port modules cost \$1,195. Dual-port modules cost \$295.

Contact Lightwave Communications, 84 Research Rd., Milford, CT 06460; (203) 878-9838.

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## Stick With What Works

### Develop Softly, But Carry A Big Stick



By **Gordon McLachlan**

When I look at all the languages and development tools out there: Object-oriented programming (OOP) languages, visual programming languages, event-driven programming languages, and standard, non-standard and substandard programming languages, I'm more than a bit confused. Which brings to my troubled mind a story from my childhood about *The General*.

The General was a shell-shocked veteran who wandered around our neighborhood. He was smartly dressed in a military uniform. Carrying a swagger stick, the General always looked like he was going somewhere. And sometimes, he even looked like he knew where that might be.

The accepted protocol was to give the General the benefit of the doubt. Our mothers had warned us about strangers. And at the time, it seemed they didn't get much stranger than the General. But one day, one of my buddies got the nerve to ask the General what the stick was for.

"It keeps me from getting lost," said the General.

"How's it work?" asked my friend.

"I don't know," said the General, "the damn thing is broke."

Wandering around was the General's job. And as you might imagine, anything that would keep him from getting lost would make that job a bit easier. Can you blame him for wanting a decent tool to get his job done. That's not crazy. That's prudent. Maybe he just picked the wrong tools.

People buy crystals for their healing power and go to church to worship inanimate objects, which are supposedly filled with some kind of holy spirit or another, but we don't call them crazy. So why get on the General's case for his stick?

We're always looking for some magical solution to keep us out of trouble or — mostly — to get us out of the trouble we're already in. It's not surpris-

ing then that we expect supernatural salvation to always be around the corner. Too bad we can't always find it.

The General, at least, knew his stick wasn't working, showing he wasn't completely deluded. And he never made any claims about why it should work, which puts him ahead of most of us. We're always full of reasons about why tools that don't work should have worked just perfectly.

I don't know if the General's swagger stick ever worked. Maybe someone told him it would keep him from getting lost (probably the guy who sold it to him). Or maybe the General thought he got lost a little less often when he carried it with him. Either way, I doubt he had any empirical evidence to back up his faith in that stick.

But how many of us place the same blind faith in the software development tools we use? Are you coding in Visual Basic, C, COBOL or some 4GL because you absolutely, positively know that it's the best tool for the job. Or, is there another reason? Is there any empirical evidence that lends credence to your choice?

I think not. Maybe you're just using what's available on your platform, or something cheaper than the alternatives, or maybe you're just following tradition. Like the General, maybe? What choice did he really have? To his credit, the General's stick was certainly cheap enough. He would have been in big trouble if he had been trying to get a magic Jeep to drive him home. A talking dog might have been better, but then he would have to feed it. A burden for the General on his disability pension.

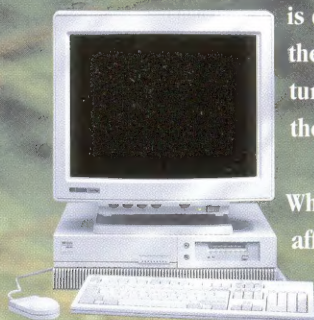
So, the General stuck with his stick. We should all be so crazy.

McLachlan's Internet address:  
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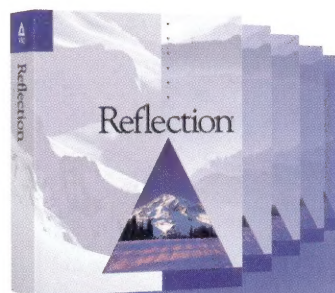
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